



TERASAKI (EUROPE) LTD.

80 Beardmore Way, Clydebank Industrial Estate
Clydebank, Glasgow, G81 4HT, Scotland (UK)
Telephone: 44-141-941-1940
Fax: 44-141-952-9246
Email: marketing@terasaki.co.uk
<http://www.terasaki.com/>

TERASAKI ITALIA s.r.l.

Via Ambrosoli, 4A-20090 Rodano, Milano, Italy
Telephone: 39-02-92278300
Fax: 39-02-92278320
Email: info@terasaki.it
<http://www.terasaki.it/>

TERASAKI ESPAÑA S.A.U.

Roma, s/n 08400 Granollers, Barcelona, Spain
Telephone: 34-93-879-60-50
Fax: 34-93-870-39-05
Email: terasaki@terasaki.es
<http://www.terasaki.es/>

TERASAKI SKANDINAVISKA AB

Fräsarvägen 32, SE-142 50 Skogås, Sweden
Telephone: 46-8-556-282-30
Fax: 46-8-556-282-39
Email: info@terasaki.se
<http://www.terasaki.se/>

TERASAKI CIRCUIT BREAKERS (S) PTE. LTD.

9 Toh Guan Road East 03-01 Alliance Building
Singapore 608604
Telephone: 65-6425-4915
Fax: 65-6425-4351
Email: tecs@pacific.net.sg

TERASAKI ELECTRIC (M) SDN, BHD.

Lot 3, Jalan 16/13D, 40000 Shah Alam, Selangor Darul
Ehsan, Malaysia
Telephone: 60-3-5549-3820
Fax: 60-3-5549-3960
Email: terasaki@terasaki.com.my

TERASAKI DO BRASIL LTDA.

Rua Cordovil, 259-Parada De Lucas, 21250-450
Rio De Janeiro-R.J., Brazil
Telephone: 55-21-3301-9898
Fax: 55-21-3301-9861
Email: terasaki@terasaki.com.br
<http://www.terasaki.com.br>

TERASAKI ELECTRIC (CHINA) LTD.

72 Pacific Industrial Park, Xin Tang Zengcheng,
Guangzhou 511340, China
Telephone: 86-20-8270-8556
Fax: 86-20-8270-8586
Email: terasaki@public.guangzhou.gd.cn

**TERASAKI ELECTRIC GROUP SHANGHAI
REPRESENTATIVE OFFICE**

Room No. 1405-6, Tomson Commercial Building
710 Dong Fang Road, Pudong, Shanghai, 200122, China
Telephone: 86-21-58201611
Fax: 86-21-58201621
Email: terasaki@vip.163.com

TERASAKI ELECTRIC CO., LTD.

Head Office: 7-2-10 Hannancho, Abenoku
Osaka, Japan
Circuit Breaker Division: 7-2-10 Kamihigashi, Hiranoku Osaka, Japan
Telephone: 81-6-6791-9323
Fax: 81-6-6791-9274
Email: int-sales@terasaki.co.jp
<http://www.terasaki.co.jp/>



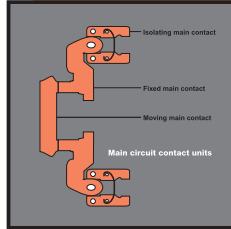
TemPower

Simply two steps ahead

TEMPOWER 2 THE DOUBLE BREAKER

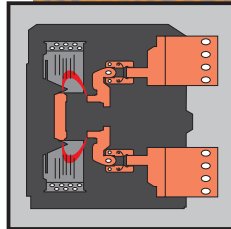
Breaking Contacts

Tempower2 is the world's first **DoubleBreak ACB**, having two breaking contacts per phase. The unique pole structure means that the short-time withstand rating (I_{cs}) is equal to the service short-circuit breaking capacity (I_{cs}) for all models.



Packing Density

You can increase switchboard packing density using the smallest one-second rated ACB on the market. The fixed version is 290mm deep, the drawout version is 345mm deep.

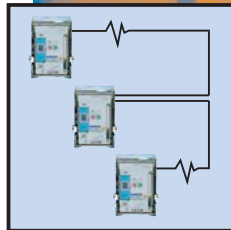


Reliability

DoubleBreak contacts increase service life. Electrical and mechanical endurance ratings are the best available, and exceed the requirements of IEC 60 947-2.

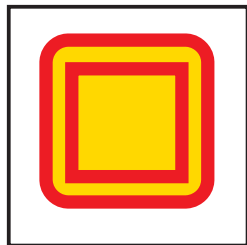
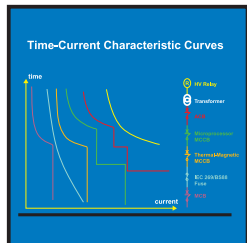
Double Quick Opening

Tempower2 ACBs clear short-circuit faults in less than 30ms. That's twice as fast as most ACBs.



Zone Interlocking

During a fault; considerable thermal and mechanical stresses are placed on the entire system. With the *Tempower2 Z* Interlock system, the breaker nearest the fault will trip first, irrespective of the short time delay setting.



Protection Characteristics

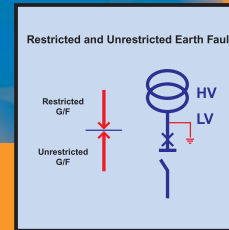
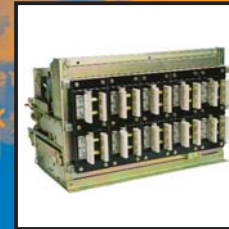
Tempower2 is the only ACB which offers time-current characteristics to 3 different standards:

- IEC 60 947-2 (low voltage circuit breakers)
- IEC 60 255-3 (electrical relays)
- Lloyds Register of Shipping (for marine generator protection)

All models have LSI protection.

Double Insulation Properties

All operator controls and accessory locations are double insulated from the main phases.



Reduce Time to Repair

Modular construction means that each pole of the *Tempower2 ACB* can be replaced in about 15 minutes – by the user. This unique feature will reduce downtime for end-users.

Control and Monitoring Options

Circuit breaker control and monitoring can be implemented either by hard wiring or digital data transmission. The *Tempower2 ACB* can support Modbus communication protocol.

Double Opening and Closing Coils

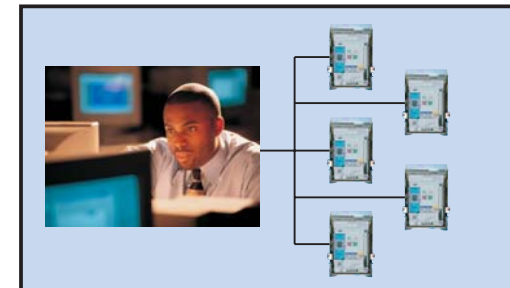
Now you can extend control system redundancy to an ACB. Double coils allow designers to implement back-up tripping and closing systems.

Double Neutrals

How do you make a system harmonic proof in the face of increasing triple-N harmonic currents? Terasaki have launched the first Double Neutral ACB. The AH-60DN will carry 10,000A of neutral current.

Double Ground Fault Protection

Restricted and Unrestricted Ground Fault Protection. The AGR-B Protection Relay offers Ground Fault Protection on the line/transformer side (Restricted) and load side (Unrestricted) of the ACB.



TEMPOWER 2 ACB SELECTION GUIDE



ACB Frame Size		AR 2		AR 3		AR 4	AH6	
Type		S	H	S	H	S	H	
In	Rated Current (A)	800/1250/1600/2000	1250/1600/2000	2500/3200	1600/2000/2500/3200	4000	5000/6300/6300	
IN	Rated Current (A) in the Neutral Pole	800/1250/1600/2000	1250/1600/2000	2500/3200	1600/2000/2500/3200	4000	5000/6300/10000	
ACB Model		AR208S/AR212S/AR216S/AR220S	AR212H/AR216H/AR220H	AR325S/AR332S	AR316H/AR320H/AR325H/AR332H	AR440S	AH-50C/AH-60C/AH-60C-DN	
Ics SERVICE BREAKING CAPACITY								
(kA, symmetrical r.m.s)	690V ⁵	50	55	65	85	75	85 ¹	
	440V	65	80	85	100	100	120 ¹	
	400/415V	65	80	85	100	100	120 ¹	
Icm MAKING CAPACITY								
(kA, asymmetrical peak)	690V ⁵	105	121	143	187	165	187 ¹	
	440V	143	176	187	220	220	264 ¹	
	400/415V	143	176	187	220	220	264 ¹	
Icw SHORT-TIME WITHSTAND								
(kA rms)	1 Second	65	80	85	100	100	100/120 ²	
	3 Seconds	50	55	65	75	85	70	
Endurance								
(With maintenance)	Mechanical	30000 ³	30000 ³	20000	20000	15000	---	
(Without maintenance)	Mechanical	15000 ³	15000 ³	10000	10000	8000	1500	
(Without maintenance AC 460V)	Electrical	12000 ³	12000 ³	7000	7000	5000	500	
(Without maintenance AC 690V)	Electrical	10000 ³	10000 ³	5000	5000	5000	---	
Number of operating cycles								
Times								
Breaking Time (second) maximum.		0.03	0.03	0.03	0.03	0.03	0.03	
Spring Charging Time (second) maximum.		10	10	10	10	10	10	
Closing Time (second) maximum.		0.08	0.08	0.08	0.08	0.08	0.04	
Dimensions								
Fixed Type (mm)		W 3pole	360	360	466	466	---	---
		W 4pole	445	445	586	586	---	---
		H	460	460	460	460	---	---
		D	290	290	290	290	---	---
Drawout Type (mm)		W 3Pole	354	354	460	460	631	747
		W 4pole	439	439	580	580	801	937/1126 ⁴
		H	460	460	460	460	460	685
		D	345	345	345	345	375	589

These specifications are common throughout the whole range :

Rated Operational Voltage [Ue] (V.50/60Hz)-690

AC Rated Insulation Voltage [Ui] (V.50/60Hz)-1000

Rated Impulse Withstand Voltage [Uimp] (kV)-12 (8 for AH ACBs)

Applicable standards:

IEC 60947-2

EN 60947-2

JIS C8372 (New JIS C8201- 2 is also supported)

AS 3947- 2

NEMA PUB NO.SG3

¹ With Instantaneous Protection

² AH 50C/AH 60C for more information refer to catalogue ref. 00-152E

³ AR220 S&H - Mechanical (with maintenance) Endurance 25000 Cycles

- Mechanical (without maintenance) Endurance 12000 Cycles

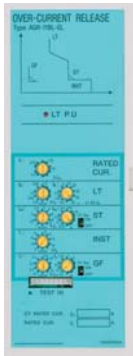
- Electrical AC460V (without maintenance) Endurance 10000 Cycles

- Electrical AC690V (without maintenance) Endurance 7000 Cycles

⁴ For five pole double neutral AH-60C-DN

⁵ For unearthed IT systems please contact Terasaki

PROTECTION RELAY GUIDE



Economy AGR -11B
Dial Adjustment



Standard AGR -21/22B
LCD 'Ammeter'



Advanced AGR -31B
LCD 'Analyser'

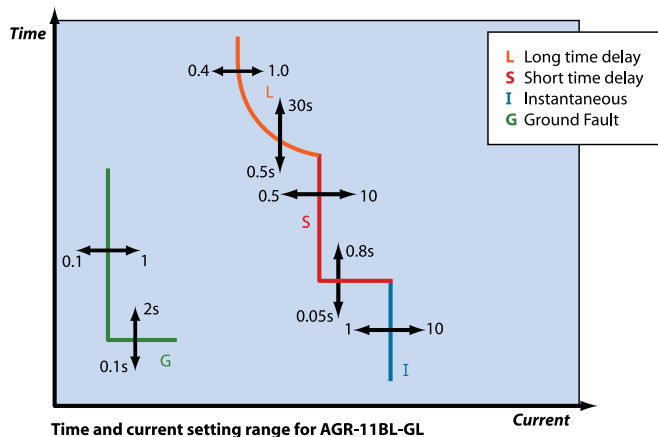
PROTECTION RELAYS	PROTECTION TYPES	PROTECTION AND INDICATION				
		OVER LOAD	SHORT CIRCUIT	GROUND FAULT	FLEETING INDICATION	INDIVIDUAL INDICATION
AGR-B 11B Economy 21/22B Standard 31B Advanced	TIME CURRENT CURVE L Feeder	AL	✓	✓		✓
	S Generator	GL	✓	✓	✓	
	R IEC-60255	PS	✓	✓		✓
		PG	✓	✓	✓	✓

Example of the product coding guide

AGR-11BL-GL

The *TemPower2* Protection Relay Range is equipped with RMS sensing and has a wide range of protection functions. Options available:

- Ground Fault (*Unrestricted and Restricted*)
- Earth Leakage
- Pre Trip Alarm
- Neutral Protection
- Individual Contact Indication & LCD
- Spring Charge and Trip Indication
- Undervoltage Alarm
- Reverse Power
- Zone Interlocking
- Contact Temperature Monitoring
- Communication
- Phase Rotation Protection



Safety and protection are the prime purposes of Terasaki products. You care about safety and protection. The people who depend on products you specify care about safety and protection. We call the *TemPower2* ACB the Double Breaker. Throughout this leaflet you will see key features of our Double Break ACB. It is one of the world's smallest and offers high specifications with guaranteed reliability.

Please read on and discover the benefits of the *TemPower2* Double Breaker.