POWER FACTOR CORRECTION CAPACITOR

Mikro's capacitors are designed for power factor correction in applications such as motors, transformers, generators and supply cables. The capacitors are manufactured using metallised polypropylene film as the dielectric. The dry type capacitor operates within a cylindrical aluminium case.

APPLICATIONS

Used for both single phase and 3 phase, depending on the design on the user for power factor improvement values.

Appropriate for industrial and general use.

FEATURES

1. General industrial use
2. Improves power factor
3. Reduces line losses
4. Decreases voltage drop
5. Saves energy
6. Metallised Prolypropylene film which has low losses
7. Compact design
8. Dry type aluminum cylinder
9. Oil type steel case
10. Self healing Technology
11. Overpressure disconnector
12. Discharge and bleeding resistor included
13. Adhere to IEC 60831-1 and IEC 60831-2 standards
14. Long life

TECHNICAL SPECIFICATION

Type	Dry Type (Cylinder type)	Oil Type
Voltage Range	220...690 V AC	230...660 V AC
Frequency	50Hz 60Hz (Upon request)	50Hz 60Hz (Upon request)
Power Range	2.5kVAR to 60kVAR	5kVAR to 75kVAR
Capacitor Losses	< 0.35 W/kVAR	< 0.35 W/kVAR
Total Losses with Discharge Resistor	< 1.0 W/kVAR	< 1.0 W/kVAR
Capacity Tolerance	-5% ~ 10% (at 20°C)	-5% ~ 10% (at 20°C)
Max Overvoltage	Un + 10% (up to 8 hours daily) Un + 15% (up to 30 mins daily) Un + 20% (up to 5 mins monthly) Un + 30% (up to 1 mins monthly)	Un + 10% (up to 8 hours daily) Un + 15% (up to 30 mins daily) Un + 20% (up to 5 mins monthly) Un + 30% (up to 1 mins monthly)
Max Overcurrent	1.3 x In	1.3 x In
Withstand Voltage	2.15 x Un (10 seconds)	2.15 x Un (10 seconds)
Connection	3 phase (Single phase on request)	3 phase (Single phase on request)
Insulation Level	3/15kV	3/15kV
Dielectric	Metallised Polypropylene	Metallised Polypropylene
Ambient Temp	-25°C ~ 55°C	-25°C ~ 45°C
Discharge	External discharge module	External discharge module
Cooling	Natural forced	Natural forced
Impregnation	Epoxy resin	Capacitor Oil (Non PCB)
Safety	Self healing technology Overpressure disconnector	Self healing technology Overpressure disconnector
Installation Place	Indoor (Outdoor on request)	Indoor (Outdoor on request)
Applicable Standards	IEC60831-1, IEC60831-2	IEC60831-1, IC60831-2

POWER FACTOR CORRECTION CAPACITOR

ORDERING INFORMATION

Part No.	Rated (kVAR)	Cn (uF)	Current In (Amp)	Dimensions D*H (mm)	Stud Screw
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 230V AC)					
MKC-235025KT	2.5	150.4	6.3	63*165	M12
MKC-235050KT	5	300.9	12.6	86*170	M12
MKC-235075KT	7.5	451.3	18.8	86*230	M12
MKC-235100KT	10	601.7	25.1	86*275	M12
MKC-235125KT	12.5	752.2	31.4	86*275	M12
MKC-235150KT	15	902.6	37.7	96*275	M12
MKC-235200KT	20	1203.4	50.2	116*305	M12
MKC-235250KT	25	1504.3	62.8	136*305	M12
MKC-235300KT	30	1805.2	75.3	136*305	M12
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 380V AC)					
MKC-385025KT	2.5	55.1	3.8	63*135	M12
MKC-385050KT	5	110.2	7.6	86*140	M12
MKC-385075KT	7.5	165.3	11.4	86*170	M12
MKC-385100KT	10	220.4	15.2	86*230	M12
MKC-385125KT	12.5	275.5	19.0	86*230	M12
MKC-385150KT	15	330.7	22.8	86*275	M12
MKC-385200KT	20	440.9	30.4	96*275	M12
MKC-385250KT	25	551.1	38.0	116*275	M12
MKC-385300KT	30	661.3	45.6	116*280	M12
MKC-385400KT	40	881.7	60.8	136*280	M12
MKC-385500KT	50	1102.2	76.0	136*355	M12
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 400V AC)					
MKC-405025KT	2.5	49.7	3.6	63*135	M12
MKC-405050KT	5	99.5	7.2	86*140	M12
MKC-405075KT	7.5	149.2	10.8	86*170	M12
MKC-405100KT	10	198.9	14.4	86*230	M12
MKC-405125KT	12.5	248.7	18.0	86*230	M12
MKC-405150KT	15	298.4	21.7	86*275	M12
MKC-405200KT	20	397.9	28.9	96*275	M12
MKC-405250KT	25	497.4	36.1	116*275	M12
MKC-405300KT	30	596.8	43.3	116*305	M12
MKC-405400KT	40	795.8	57.7	136*305	M12
MKC-405500KT	50	994.7	72.2	136*380	M12

ORDERING INFORMATION

Part No.	Rated (kVAR)	Cn (uF)	Current In (Amp)	Dimensions D*H (mm)	Stud Screw
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 415V AC)					
MKC-415025KT	2.5	46.2	3.5	63*135	M12
MKC-415050KT	5	92.4	7.0	63*165	M12
MKC-415075KT	7.5	138.6	10.4	86*170	M12
MKC-415100KT	10	184.8	13.9	86*230	M12
MKC-415125KT	12.5	231.0	17.4	86*230	M12
MKC-415150KT	15	277.2	20.9	86*275	M12
MKC-415200KT	20	369.6	27.8	96*275	M12
MKC-415250KT	25	462.1	34.8	116*275	M12
MKC-415300KT	30	554.5	41.7	116*305	M12
MKC-415400KT	40	739.3	55.6	136*305	M12
MKC-415500KT	50	924.1	69.6	136*380	M12
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 440V AC)					
MKC-445025KT	2.5	41.1	3.3	63*135	M12
MKC-445050KT	5	82.2	6.6	63*165	M12
MKC-445075KT	7.5	123.3	9.8	86*170	M12
MKC-445100KT	10	164.4	13.1	86*170	M12
MKC-445125KT	12.5	205.5	16.4	86*230	M12
MKC-445150KT	15	246.6	19.7	86*230	M12
MKC-445200KT	20	328.8	26.2	86*275	M12
MKC-445250KT	25	411.0	32.8	96*275	M12
MKC-445300KT	30	493.2	39.4	116*275	M12
MKC-445400KT	40	657.7	52.5	136*305	M12
MKC-445500KT	50	822.1	65.6	136*305	M12

POWER FACTOR CORRECTION CAPACITOR

ORDERING INFORMATION

Part No.	Rated (kVAR)	Cn (uF)	Current In (Amp)	Dimensions D*H (mm)	Stud Screw
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 480V AC)					
MKC-485025KT	2.5	34.5	3.0	63*135	M12
MKC-485050KT	5	69.1	6.0	86*140	M12
MKC-485075KT	7.5	103.6	9.0	86*170	M12
MKC-485100KT	10	138.2	12.0	86*230	M12
MKC-485125KT	12.5	172.7	15.0	86*230	M12
MKC-485150KT	15	207.2	18.0	86*275	M12
MKC-485200KT	20	276.3	24.1	96*275	M12
MKC-485250KT	25	345.4	30.1	116*275	M12
MKC-485300KT	30	414.5	36.1	116*275	M12
MKC-485400KT	40	552.6	48.1	136*280	M12
MKC-485500KT	50	690.8	60.1	136*355	M12
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 525V AC)					
MKC-525025KT	2.5	28.9	2.7	63*135	M12
MKC-525050KT	5	57.7	5.5	86*140	M12
MKC-525075KT	7.5	86.6	8.2	86*170	M12
MKC-525100KT	10	115.5	11.0	86*230	M12
MKC-525125KT	12.5	144.4	13.7	86*230	M12
MKC-525150KT	15	173.2	16.5	86*275	M12
MKC-525200KT	20	231.0	22.0	96*275	M12
MKC-525250KT	25	288.7	27.5	116*275	M12
MKC-525300KT	30	346.5	33.0	116*275	M12
MKC-525400KT	40	461.9	44.0	136*280	M12
MKC-525500KT	50	577.4	55.0	136*355	M12
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 660V AC)					
MKC-665100KT	10	73.1	8.7	86*230	M12
MKC-665150KT	15	109.6	13.1	86*275	M12
MKC-665200KT	20	146.1	17.5	96*275	M12
MKC-665250KT	25	182.7	21.9	116*275	M12
MKC-665300KT	30	219.2	26.2	116*275	M12
MKC-665400KT	40	292.3	35.0	136*305	M12
MKC-665500KT	50	365.4	43.7	136*380	M12
MKC-665600KT	60	438.4	52.5	136*380	M12

POWER FACTOR CORRECTION CAPACITOR

ORDERING INFORMATION

Part No.	Rated (kVAR)	Cn (uF)	Current In (Amp)	Dimensions D*H (mm)	Stud Screw
DRY TYPE CAPACITOR CYLINDER (3 PHASE, 50Hz, 690V AC)					
MKC-695050KT	5	33.4	4.2	63*165	M12
MKC-695075KT	7.5	50.1	6.3	86*170	M12
MKC-695100KT	10	66.9	8.4	86*230	M12
MKC-695125KT	12.5	83.6	10.5	86*230	M12
MKC-695150KT	15	100.3	12.6	86*275	M12
MKC-695200KT	20	133.7	16.7	96*275	M12
MKC-695250KT	25	167.1	20.9	96*275	M12
MKC-695300KT	30	200.6	25.1	116*275	M12
MKC-695400KT	40	267.4	33.5	136*305	M12
MKC-695500KT	50	334.3	41.8	136*305	M12
OIL TYPE CAPACITOR (3 PHASE 50 Hz, 230V AC)					
MMS-235010KT	10	601.7	25.1	215*205	n/a
MMB-235015KT	15	902.6	37.7	210*170	n/a
MMB-235020KT	20	1203.4	50.2	210*180	n/a
MMB-235025KT	25	1504.3	62.8	210*230	n/a
MMB-235030KT	30	1805.2	75.3	210*240	n/a
MMB-235040KT	40	2406.9	100.4	210*310	n/a
MMB-235050KT	50	3008.6	125.5	210*360	n/a
OIL TYPE CAPACITOR (3 PHASE 50 Hz, 415V AC)					
MMM-415005KT	5	92.4	7.0	89*165	n/a
MMS-415007KT	7.5	138.6	10.4	215*130	n/a
MMS-415010KT	10	184.8	13.9	215*155	n/a
MMS-415012KT	12.5	231.0	17.4	215*205	n/a
MMS-415015KT	15	277.2	20.9	215*205	n/a
MMS-415020KT	20	369.6	27.8	215*255	n/a
MMB-415025KT	25	462.1	34.8	210*180	n/a
MMB-415030KT	30	554.5	41.7	210*220	n/a
MMB-415040KT	40	739.3	55.6	210*240	n/a
MMB-415050KT	50	924.1	69.6	210*290	n/a

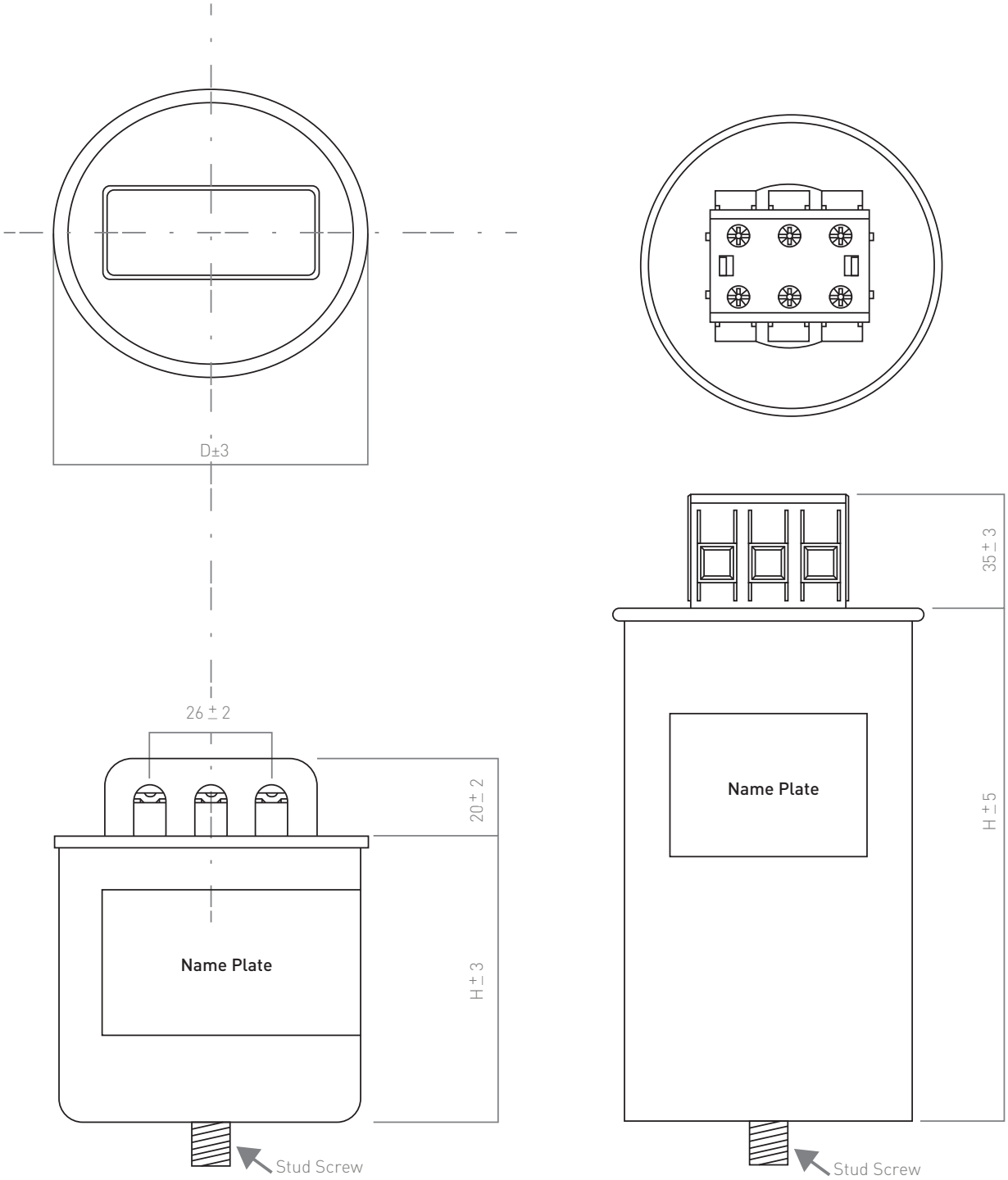
POWER FACTOR CORRECTION CAPACITOR

ORDERING INFORMATION

Part No.	Rated (kVAR)	Cn (uF)	Current In (Amp)	Dimensions D*H (mm)	Stud Screw
OIL TYPE CAPACITOR (3 PHASE 50 Hz, 440V AC)					
MMS-445010KT	10	164.4	13.1	215*155	n/a
MMS-445015KT	15	246.6	19.7	215*205	n/a
MMS-445020KT	20	328.8	26.2	215*255	n/a
MMB-445025KT	25	411.0	32.8	210*180	n/a
MMB-445030KT	30	493.2	39.4	210*190	n/a
MMB-445040KT	40	657.7	52.5	210*230	n/a
MMB-445050KT	50	822.1	65.6	210*280	n/a
OIL TYPE CAPACITOR (3 PHASE 50 Hz, 525V AC)					
MMS-525005KT	5	57.7	5.5	215*115	n/a
MMS-525010KT	10	115.5	11.0	215*175	n/a
MMS-525012KT	12.5	144.4	13.7	215*205	n/a
MMS-525015KT	15	173.2	16.5	215*255	n/a
MMB-525020KT	20	231.0	22.0	210*170	n/a
MMB-525025KT	25	288.7	27.5	210*180	n/a
MMB-525030KT	30	346.5	33.0	210*220	n/a
MMB-525040KT	40	461.9	44.0	210*280	n/a
MMB-525050KT	50	577.4	55.0	210*310	n/a
OIL TYPE CAPACITOR (3 PHASE 50 Hz, 660V AC)					
MMS-665010KT	10	73.1	8.7	215*155	n/a
MMS-665015KT	15	109.6	13.1	215*205	n/a
MMS-665020KT	20	146.1	17.5	215*255	n/a
MMB-665025KT	25	182.7	21.9	210*180	n/a
MMB-665030KT	30	219.2	26.2	210*220	n/a
MMB-665040KT	40	292.3	35.0	210*240	n/a
MMB-665050KT	50	365.4	43.7	210*290	n/a
MMB-665060KT	60	438.4	52.5	210*350	n/a
MMB-665075KT	75	548.1	65.6	210*410	n/a

CASE DIMENSIONS

DRY TYPE CAPACITOR

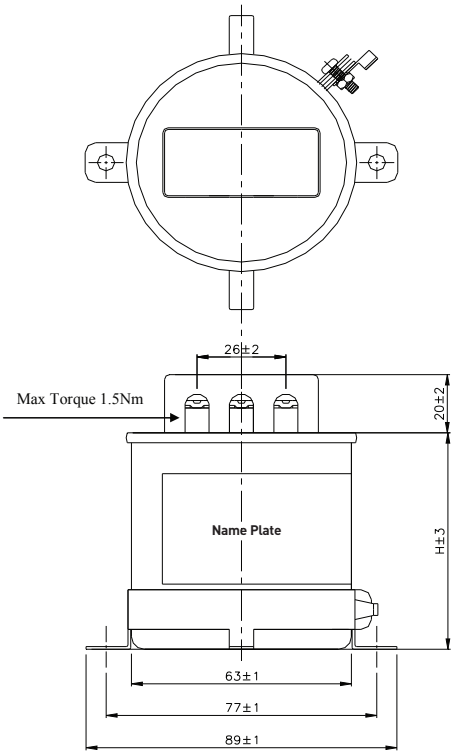


Unit in mm

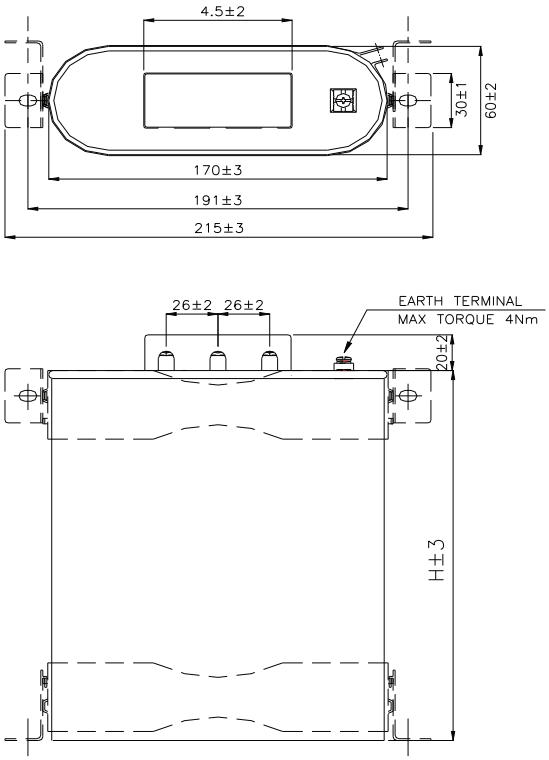
Please see the Ordering Information for the Dimension D, H and Stud screw size

CASE DIMENSIONS

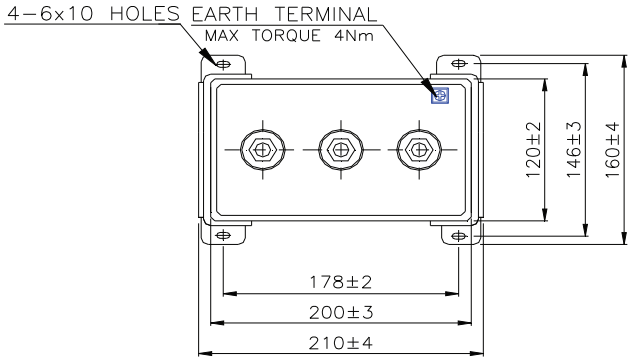
OIL TYPE CAPACITOR

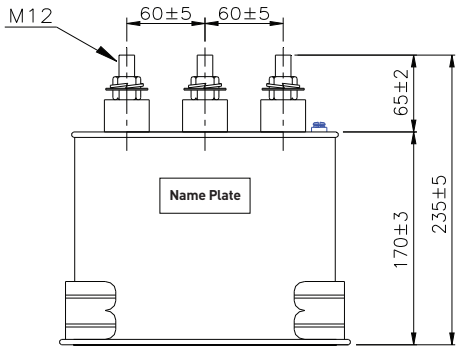


MMM Series



MMS Series





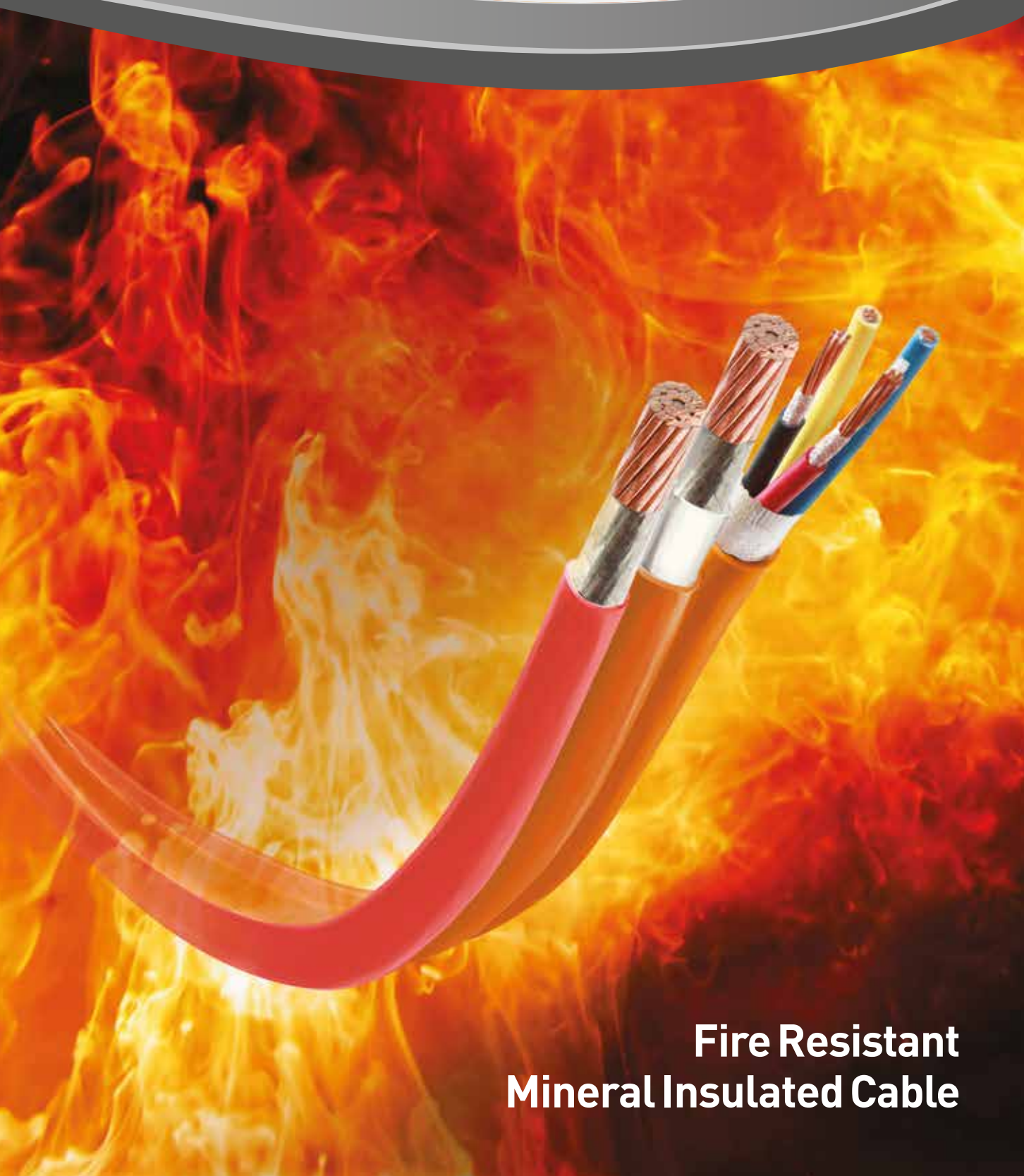
MMB Series

Unit in mm

Please see the Ordering Information for the Dimension D and H

PYROTEC™

Engineered for Safety



Fire Resistant Mineral Insulated Cable

PYROTEC™ Fire Resistant Mineral Insulated Cable

Buildings Fire Safety

Buildings today are not only designed to be eye catching state-of-the-art architectures, they must be safe and enduring at the same time. It must be able to withstand various unforeseen circumstances prevalent in our aggressive environment today. Whilst steel and concrete structures form the physical backbone of buildings, fire-rated cables act as the main arteries, feeding life by distributing critical power and activating alarm signals during fire emergencies. This convenience of modern lifestyle comes without compromising on fire safety. In the event of a fire, a poor quality fire-rated cable is akin to failing arteries that becomes the main culprit of heat and flame propagation within a building. It is a known fact that the failure of cable integrity is the main source of fire incidence, leading to major catastrophic damage to building structures and even loss of human lives. Inferior materials in such cables can emit excessive smoke, acidic gases and toxic fumes in an event of fire, incapacitating human life.

As such, architects and engineers have the utmost responsibility to ensure every possible safety feature is in place in the event of fires in buildings. Ensuring and protecting occupants' safety is an ultimatum. Hence, selection of fire resistant cables have become even more critical to ensure power connectivity of all essential facilities such as generator systems, fire alarms, smoke and fire shutters, public address (PA) systems, emergency lightings, CCTV, lifts and other electrical/electronic systems.

Selecting the Right Cable

The fire resistant cable industry has evolved from the most rigid design of Mineral Insulated Copper Cladded Cable (MICC) to the flexible Fire Resistant Mineral Insulated Cable (FRMI). Building designs can be compromised with cheaper cable insulation such as XLPE or PVC. This has undermined and defeated the purpose of fire performance cable, increasing the risk of flame propagation and hazardous gas build-up in the event of a fire. Today, structures are getting taller, with more complex building facilities and more critical space utilization. Hence, the selection criteria of fire resistant cable is most vital in the prevention and full protection in the event of an untoward situation.

Evolution of FR Cable Design

Performance Driven (MICC)
- Mechanically robust
- Watertight
- Corrosion resistant
- Flameproof
- No hazardous gases
- Ability to perform during critical moments
- 105°C Operating Temperature

Technology Advancement (Flexible FRMI)
- Ensuring MICC's performance
- More cost effective
- Better flexibility
- Easy Installation
- 110°C Operating Temperature

Cost Compromising (FR XLPE/PVC)
- Replicate FRMI physically whilst compromising product quality & performance (e.g. flammability & acidic gases emission)
- Designers are usually confused by the few adopted test standards
- 90°C Operating Temperature.

The selection of cable insulation and sheath materials determines the performance characteristic of the cable during fire. The window of safety margin is directly corresponding to the degree of operating temperature, flammability index, smoke and toxicity level as well as the halogen gas content. Hence, it is vital to ensure consistency in product quality by evaluating the manufacturer's reputation as well as the product's third party accredited testing & certification bodies.

As one of the key players in the fire resistant cable industry, we are fully aware that cost is always an important factor in all project design consideration. However, we also observed that this factor can be magnified at different decision-making levels and could be confusing to many project owners. Copper, being the key material that constitutes more than 50% of the entire cable construction is a price transparent commodity. What usually determines the cost of the fire resistant cable is the insulation material used and the value of its production processes. In today's price competitive market, the type of insulation material is commonly overlooked and compromised in many installations. We strongly believe that fire safety should never be compromised in any engineering design.

PYROTEC™ Engineered for Safety

PYROTEC™, the high-performance Fire Resistant Mineral Insulated Cable (FRMI) is the result of joint venture between EITA Power System Sdn Bhd and Universal Cable (M) Berhad, combining the best fit of marketing distribution with the best reputation in cable production. PYROTEC™ is developed based on our knowledge of 'Fire Technology', incorporating new developments in material engineering and our consistent innovation whilst achieving the highest cable standards in all three main aspects of fire resistant cable namely in fire performance, prevention and safety requirements. We pride ourselves in our unceasing innovation in product design and in delivering service excellence to meet the ever changing market needs.

PYROTEC™ FRMI 110 is developed to meet the rising pressures faced by consultants in selecting the best cost effective yet high performance cable for their designs. The highly cross-linked, mineral-filled insulation compound is engineered to optimize safety requirements, especially in the area of enhanced thermal ageing properties of 110°C operating temperature. This compound is non-flammable, halogen-free, low smoke and toxic emission and is highly self-extinguishing; offering significant cost, weight and space savings while still providing a superior level of fire safety with enhanced cable life span.

Cable Characteristics

Fire Resistant
IEC 60331-21
BS 6387 CWZ

Flame Retardant
IEC 60332-3
(22,23,24)

Low Smoke Density
IEC 61034-2

Operating
Temperature 110°C
BS EN 50363-1

Zero Halogen
IEC 60754 - 1 & 2
BS EN 50525-1

Termite & Rodents
Resistant (Optional)

Single Insulated

Cable Construction

Temperature Rating	110˚C
Voltage, Uo/U	600 / 1000 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Fire Proof Layer	Glass Mica Tape
Insulation	Flame Retardant Cross-linked Low Smoke Zero Halogen Mineral Insulation (FRMI 110); RED

Cable Characteristic / Performance

Fire Resistant in compliance to IEC 60331-21, BS 6387 CWZ

Flame Retardant in compliance to IEC 60332-3 (22, 23, 24)

Operation temperature at 110˚C in compliance to BS EN 50363-1

Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1

Low Smoke density in compliance to IEC 61034-2.

Voltage Test	3.5 kV / 5 min.
Minimum Bending Radius	6 ~ 8 times of overall diameter (OD)

Conductor			Nominal insulation thickness	Approx. diameter of cable	Approx. cable weight	Max. conductor resistance at 20˚C	Current rating in air	Voltage drop
Size	No. of strands	Nominal diameter					Trefoil	Trefoil
mm^2	No.	mm	mm	mm	Kg / Km	Ω / Km	Amps	mV / A/m
1.5	7	1.6	0.7	3.5	25	12.1	25	28.4
2.5	7	2.0	0.7	3.9	35	7.41	34	17.4
4	7	2.6	0.7	4.5	50	4.61	46	10.8
6	7	3.1	0.7	5.0	70	3.08	59	7.22
10	7	4.1	0.7	6.0	110	1.83	82	4.29
16	7	4.8	0.7	6.8	160	1.15	110	2.70
25	7	6.0	0.9	8.5	260	0.727	151	1.71
35	7	7.2	0.9	9.6	350	0.524	189	1.24
50	19	8.4	1.0	11.0	470	0.387	232	0.918
70	19	10.1	1.1	12.9	680	0.268	298	0.644
95	19	11.8	1.1	14.7	920	0.193	372	0.473
120	19	13.4	1.2	16.4	1,160	0.153	437	0.383
150	19	14.8	1.4	18.2	1,450	0.124	506	0.321
185	37	16.6	1.6	20.4	1,790	0.0991	590	0.268
240	37	19.0	1.7	23.0	2,340	0.0754	708	0.221
300	37	21.3	1.8	25.8	2,950	0.0601	824	0.193
400	61	24.1	2.0	28.9	3,750	0.0470	963	0.171
500	61	27.1	2.2	32.3	4,710	0.0366	1117	0.156
630	61	30.8	2.4	36.4	6,020	0.0283	1293	0.145

PYROTEC™ FR MI 110 Cable / Single Core

Double Insulated

Cable Construction

Temperature Rating	110˚C
Voltage, Uo/U	600 / 1000 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Fire Proof Layer	Glass Mica Tape
Insulation	Flame Retardant Cross-linked Low Smoke Zero Halogen Mineral Insulation (FRMI 110); WHITE
Shealth	Flame Retardant Low Smoke Zero Halogen Compound (LSOH); ORANGE

Cable Characteristic / Performance

Fire Resistant in compliance to IEC 60331-21, BS 6387 CWZ

Flame Retardant in compliance to IEC 60332-3 (22, 23, 24)

Operating temperature at 110˚C in compliance to BS EN 50363-1

Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1

Low Smoke density in compliance to IEC 61034-2

Voltage Test	3.5 kV / 5 min
Minimum Bending Radius	6 ~ 8 times of overall diameter (OD)

Conductor			Nominal insulation thickness	Nominal sheath thickness	Approx. diameter of cable	Approx. cable weight	Max. conductor resistance at 20˚C	Current rating in air	Voltage drop
Size	No. of strands	Nominal diameter						Trefoil	Trefoil
mm^2	No.	mm	mm	mm	mm	Kg / Km	Ω /Km	Amps	mV / A/m
1.5	7	1.6	0.7	1.4	6.3	55	12.1	30	28.4
2.5	7	2.0	0.7	1.4	6.7	70	7.41	40	17.4
4	7	2.6	0.7	1.4	7.3	90	4.61	53	10.8
6	7	3.1	0.7	1.4	7.8	110	3.08	67	7.22
10	7	4.1	0.7	1.4	8.8	160	1.83	92	4.29
16	7	4.8	0.7	1.4	9.6	220	1.15	121	2.70
25	7	6.0	0.9	1.4	11.3	330	0.727	163	1.71
35	7	7.2	0.9	1.4	12.4	430	0.524	200	1.24
50	19	8.4	1.0	1.4	13.8	560	0.387	244	0.918
70	19	10.1	1.1	1.4	15.7	770	0.268	310	0.644
95	19	11.8	1.1	1.5	17.7	1,040	0.193	384	0.473
120	19	13.4	1.2	1.5	19.4	1,290	0.153	448	0.383
150	19	14.8	1.4	1.6	21.4	1,610	0.124	516	0.321
185	37	16.6	1.6	1.6	23.6	1,970	0.0991	599	0.268
240	37	19.0	1.7	1.7	26.4	2,550	0.0754	715	0.221
300	37	21.3	1.8	1.8	29.4	3,190	0.0601	831	0.193
400	61	24.1	2.0	1.9	32.7	4,030	0.0470	968	0.171
500	61	27.1	2.2	2.0	36.3	5,040	0.0366	1122	0.156
630	61	30.8	2.4	2.2	40.8	6,440	0.0283	1297	0.145

PYROTEC™ FR MI 110 Cable / Multicore

Double Insulated

Cable Construction

Temperature Rating	110˚C
Voltage, Uo/U	600 / 1000 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Fire Proof Layer	Glass Mica Tape
Insulation	Flame Retardant Cross-linked Low Smoke Zero Halogen Mineral Insulation (FRMI 110); Red, Black (2 core) Red, Yellow, Blue (3 core) Red, Yellow, Blue, Black (4 core) (others colour available upon request)
Filler (if any)	Non-hygroscopic fillers
Binder (if any)	Binder tape
Shealth	Flame Retardant Low Smoke Zero Halogen Compound (LSOH); ORANGE

Cable Characteristic / Performance

Fire Resistant in compliance to IEC 60331, BS 6387 CWZ

Flame Retardant in compliance to IEC 60332-3 (22, 23, 24)

Operating temperature at 1100C in compliance to BS EN 50363-1

Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1

Low Smoke density in compliance to IEC 61034-2

Voltage Test	3.5 kV / 5 min
Minimum Bending Radius	6 ~ 8 times of overall diameter (OD)

Size	Conductor		Nominal insulation thickness	Nominal sheath thickness	Approx. diameter of cable	Approx. cable weight	Max. conductor resistance at 20˚C	Current rating in air	Voltage drop
	No. of strands	Nominal diameter						Direct clipped	1 phase
mm^2	No.	mm	mm	mm	mm	Kg / Km	Ω / Km	Amps	mV / A/m
2C x 1.5	7	1.6	0.7	1.8	11.1	140	12.1	32	32.8
2C x 2.5	7	2.0	0.7	1.8	12.0	180	7.41	42	20.1
2C x 4	7	2.6	0.7	1.8	13.0	220	4.61	55	12.5
2C x 6	7	3.1	0.7	1.8	14.2	280	3.08	71	8.34
2C x 10	7	4.1	0.7	1.8	16.0	390	1.83	97	4.96
2C x 16	7	4.8	0.7	1.8	17.7	530	1.15	127	3.12
3C x 1.5	7	1.6	0.7	1.8	11.7	170	12.1	27	28.4
3C x 2.5	7	2.0	0.7	1.8	12.6	210	7.41	36	17.3
3C x 4	7	2.6	0.7	1.8	13.7	280	4.61	47	10.8
3C x 6	7	3.1	0.7	1.8	15.0	350	3.08	60	7.22
3C x 10	7	4.1	0.7	1.8	17.0	500	1.83	82	4.29
3C x 16	7	4.8	0.7	1.8	18.8	700	1.15	108	2.70
3C x 25	7	6.0	0.9	1.8	22.3	1,040	0.727	145	1.71
3C x 35	7	7.2	0.9	1.8	24.8	1,360	0.524	178	1.24
3C x 50	19	8.4	1.0	1.8	27.8	1,780	0.387	216	0.918
3C x 70	19	10.1	1.1	1.9	32.1	2,470	0.268	274	0.643
3C x 95	19	11.8	1.1	2.0	36.1	3,300	0.193	340	0.471
3C x 120	19	13.4	1.2	2.1	40.0	4,120	0.153	394	0.382
3C x 150	19	14.8	1.4	2.3	44.4	5,130	0.124	452	0.318
4C x 1.5	7	1.6	0.7	1.8	12.6	210	12.1	27	28.4
4C x 2.5	7	2.0	0.7	1.8	13.6	260	7.41	36	17.3
4C x 4	7	2.6	0.7	1.8	14.9	340	4.61	47	10.8
4C x 6	7	3.1	0.7	1.8	16.3	440	3.08	60	7.22
4C x 10	7	4.1	0.7	1.8	18.5	630	1.83	82	4.29
4C x 16	7	4.8	0.7	1.8	20.5	890	1.15	108	2.70
4C x 25	7	6.0	0.9	1.8	24.5	1,340	0.727	145	1.71
4C x 35	7	7.2	0.9	1.8	27.3	1,750	0.524	178	1.24
4C x 50	19	8.4	1.0	1.8	30.6	2,300	0.387	216	0.918
4C x 70	19	10.1	1.1	2.0	35.6	3,230	0.268	274	0.643
4C x 95	19	11.8	1.1	2.1	40.1	4,330	0.193	340	0.471
4C x 120	19	13.4	1.2	2.3	44.6	5,420	0.153	394	0.382
4C x 150	19	14.8	1.4	2.4	49.3	6,720	0.124	452	0.318

Current Ratings

Correction Factors for Ambient Air Temperature

Ambient Temperature °C	25	30	35	40	45	50	55	60
Correction Factors	1.04	1.00	0.96	0.91	0.87	0.82	0.76	0.71

Correction Factors for Groupings

Number of circuits		**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Single layer direct clipped on a non-metallic surface	Touching	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70
	Spaced*	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Single layer **Multi-core** on a perforated metal cable tray vertical or horizontal	Touching	0.86	0.81	0.77	0.75	0.74	0.73	0.73	0.72
	Spaced*	0.91	0.89	0.88	0.87	0.87			
Single layer **Single-core** on a perforated metal cable tray touching	Horizontal	0.90	0.85						
	Vertical	0.85							

* Space by a clearance between adjacent surfaces of at least one cable diameter. No correction factor is needed, where horizontal clearance between adjacent cables exceeds 2 cable diameters.

The above are applicable to groups of cables all of one size. If a cable is expected to carry <30% of its grouped ratings, it may be ignored for the purpose of obtaining the correct factor for the rest of the groups.

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Shortform Catalogue 2013 I 2014

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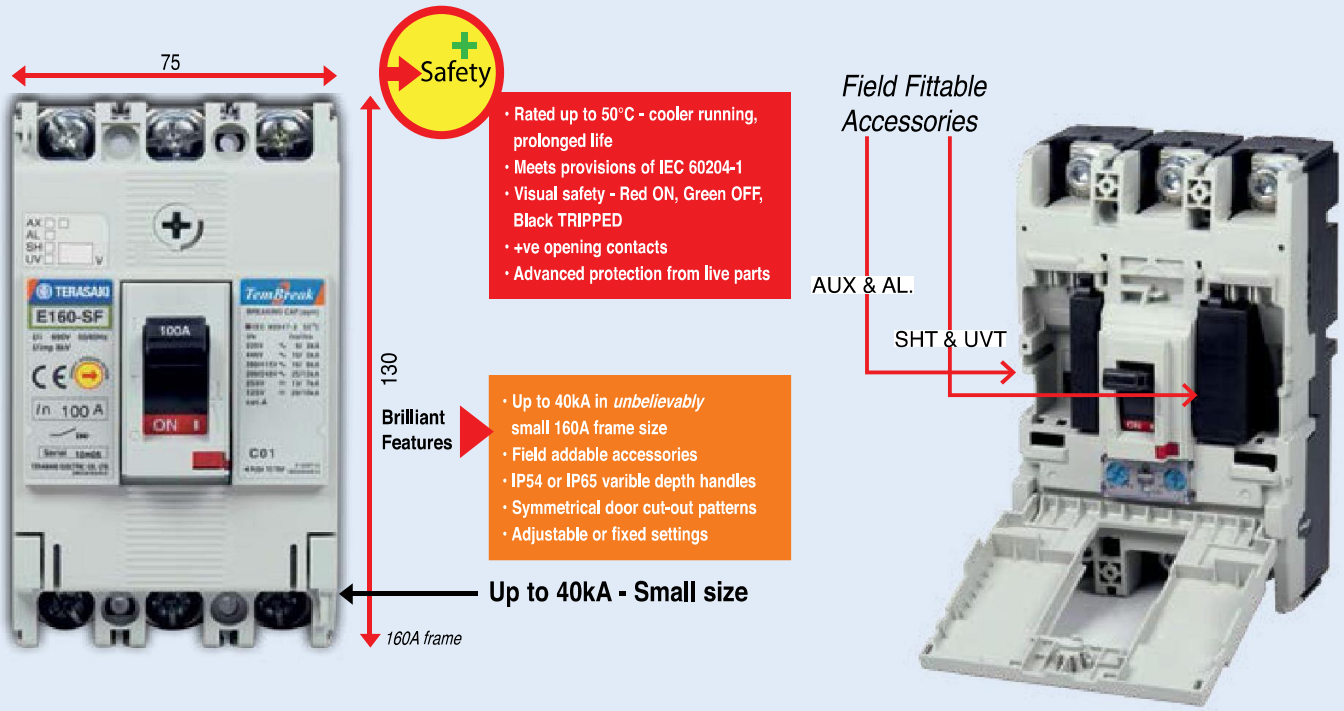
Moulded Case Circuit Breakers & Accessories

Tembreak Lite



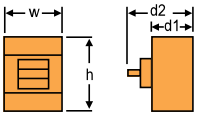
TEMBREAK LITE MCCB's

Fixed Settings

	16kA		25kA		40kA		Isolators	
3-Pole	E160-SF	E250-SCF	S160-SCF	E250-SF	S160-SF	S250-SF	S160-SN	S250-SN
4-Pole	E160-SF4	E250-SCF4	S160-SCF4	E250-SF4	S160-SF4	S250-SF4	S160-SN4	S250-SN4
Nominal Current Ratings -5 to 50˚C	016A 040A 100A	125A 225A	016A 040A 100A	125A 225A	016A 40A 100A	125A 225A	160	250
	020A 050A 125A	150A 250A	020A 050A 125A	150A 250A	020A 50A 125A	150A 250A		
	025A 063A 160A	175A	025A 063A 160A	175A	025A 63A 160A	175A		
	032A 080A	200A	032A 080A	200A	032A 80A	200A		
Ratings: Ui / Ue	690/525V	690/525V	690/525V	690/525V	690/690V	690/690V	690/690V	690/690V
Ics/Icu 400/415V	8ka/16kA	8ka/16kA	8ka/25kA	19ka/25kA	13ka/40kA	20ka/40kA		
Icu 525 V	6kA	6kA	7.5kA	7.5kA	10kA	10kA		

Adjustable Settings

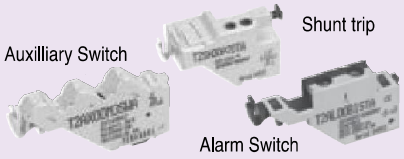
	16kA		25kA		40kA	
3-Pole	E160-SJ	E250-SCJ	S160-SCJ	E250-SJ	S160-SJ	S250-SJ
4-Pole	E160-SJ4	E250-SCJ4	S160-SCJ4	E250-SJ4	S160-SJ4	S250-SJ4
Nominal Current Ratings -5 to 50˚C	025A 100A	100A 250A	025A 100A	100A 250A	025A 100A	160A
	040A 125A	125A	040A 125A	125A	040A 125A	200A
	063A 160A	160A	063A 160A	160A	063A 160A	250A
	080A	200A	080A	200A	080A	
Ratings: Ui / Ue	690/525V	690/525V	690/525V	690/525V	690/690V	690/690V
AC Breaking Capacity Ics/Icu 400/415V	8ka/16kA	8ka/16kA	13ka/25kA	19ka/25kA	20ka/40kA	20ka/40kA
Icu 525 V	6kA	6kA	7.5kA	7.5kA	10kA	10kA
Adjustability: Thermal	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	20ka
Magnetic	6-12 x In	6-12 x In	6-12 x In	6-12 x In	6-13 x In	20ka



Dimensions: *For both adjustable & fixed settings*						
h	130mm	165mm	130mm	165mm	130mm	165mm
d1	68mm	68mm	68mm	68mm	68mm	68mm
d2	93mm	95mm	93mm	95mm	93mm	95mm
w-3P	75mm	105mm	75mm	105mm	75mm	105mm
w-4P	100mm	140mm	100mm	140mm	100mm	140mm

MCCB ACCESSORIES FOR TEMBREAK LITE

Frame Size	160A	250A
Auxiliary Switches		
1 C/O for right & Left side	A002489	A002489
1 C/O for right & Left side	A002892	A002892



Alarm Switches			
For Left Side			
Aux	Alarm	A002557	A002557
1C/O	1C/O		
For Right Side			
Aux	Alarm	A002564	A002564
1C/O	1C/O		

Shunt Trips *with terminals*		
AC100-120V	S002649	S002649
AC200-240V	S002656	S002656
AC380-450V	S002663	S002663
DC24V	S002670	S002670
Undervoltage Trips		
AC100-120V	U002779	U002779
AC200-240V	U002786	U002786
AC380-450V	U002793	U002793
DC24V	U002809	U002809
Motor Operators		
AC100-110V	–	MO905728
AC230-240V	–	MO905803
DC24V	–	MO905841
DC48V	–	MO905889

Frame Size	160A	250A
External Operating Handles		
Door Mount IP54 - Black Daros Handle	120-45-0100-02	120-45-0110-01
Door Mount IP54 - Black Handle	H908118	H909399
Door Mount IP64 - Black Handle	H908125	H909405
Breaker Mount - Black Handle	H906046	H907005
Handle Lock - required for toggle lock	H064906	H064906
Handle Holder - required for toggle lock	H064913	H064913

Daros Handles IP54

Door Mount Handle IP65

Breaker Mount Handle

Mechanical Interlocks		
Slide type machanical interlocks front rear connection 3P (*1)	M064784	M064821
Slide type mechanical interlocks front rear connection 4P (*1)	M064807	M064845

(*1) *Order one part between two MCCB*

DIN Rail Adapter		
DIN Rail mount MCCBs	D066900	D066900

Frame Size	160A	250A
Mechanical Interlocks 250Amp Frame		
Link Type Mech. Interlock right side 250AF	M064869	
Link Type Mech. Interlock left side 3P 250A	M064876	
Link Type Mech. Interlock left side 4P 250A	M064883	
Wire Type Mech. Interlock use with Link Type	M064890	
Extension Bars		
Flat bar straight type half set 3P (3 pieces)	EB061509	EB061608
Flat bar straight type half set 4P (4 pieces)	EB061516	EB061615
Flat bar offset type half set 3P (3 pieces)	EB061523	EB061622
Flat bar offset type half set 4P (4 pieces)	EB061530	EB061639
Covers		
Terminal covers for front connection 3P half set	C065248	C065286
Terminal covers for front connection 4P half set	C065255	C065293
Interpole barriers 3P 2pcs per 3P MCCB (*1)	C065682	C065729
Interpole barriers 4P 3pcs per 3P MCCB (*2)	C065682	C065729

(*1) *Order two pieces for each MCCB*
(*2) *Order three pieces for each MCCB*

Terminal Cover Interpole Barrier

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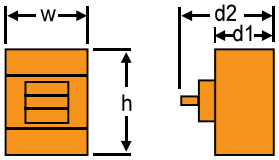
TEMBREAK MCCB's

E125-NJ

Plug-in conversion kits available



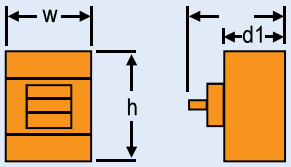
Dimensions

25kA Adjustable Settings Rated Voltage: 690 VAC @ 400V

3-Pole	E125-NJ	E250-NJ	E400-NJ
4-Pole	E125-NJ4	E250-NJ4	E400-NJ4
Nominal Current Ratings -5 to 50°C 2000m	**020A** (12.5-20)	**250A** (160 -250)	**400A** (250-400)
	032A (20-32)		
	050A (32-50)		
	063A (40-63)		
	100A (63-100)		
	125A (80-125)		
Ratings: Ui / Ue	800/525V	800/525V	800/525V
Ics/Icu 400/415V	25kA/19kA	25kA/19kA	25kA/25kA
Icu/Ics 525V	8kA/6kA	10kA/7.5kA	15kA/15kA
Protection: Thermal	0.63-1 x In	0.63-1 x In	0.63-1 x In
Magnetic	6-12 x In	6-13 x In	6-12 x In
Dimensions: h	155mm	165mm	260mm
d1	68mm	68mm	103mm
d2	92mm	92mm	145mm
w-3P	90mm	105mm	140mm
w-4P	120mm	140mm	185mm
Max Panel depth with VDH	543mm	543mm	610mm

S125-NJ

Plug-in conversion kits available



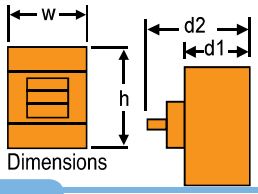
Dimensions

36kA Adjustable Settings Rated Voltage: 690VAC @400V

3-Pole	S125-NJ	S160-NJ	S250-NJ	S400-CJ	E630-NE
4-Pole	S125-NJ4	S160-NJ4	S250-NJ4	S400-CJ4	E630-NE4
				OBSOLETE	
Nominal Current Ratings -5 to 50°C 2000m	**020A** (12.5-20)	**160A** (100-160)	**200A** (126-200)	**400A** (250-400)	**630A** (250-630)
	032A (20-32)		**250A** (160-250)	*11 EX-STOCK*	
	050A (32-50)				
	063A (40-63)				
	100A (63-100)				
	125A (80-125)				
Ratings: Ui / Ue	800/690V	800/690V	800/690V	800/690V	800/690V
Ics/Icu 400/415V	30kA/36kA	36kA	36kA	36kA	36kA
Ics 525V	22kA	25kA	25kA	22kA	15kA
Protection: Thermal	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	Electronic
Magnetic	6-12 x In	6-13 x In	6-13 x In	6-12 x In	
Dimensions: h	155mm	165mm	165mm	260mm	260mm
d1	68mm	68mm	68mm	103mm	103mm
d2	92mm	92mm	92mm	145mm	145mm
w-3P	90mm	105mm	105mm	140mm	140mm
w-4P	120mm	140mm	140mm	185mm	185mm
Max Panel depth with VDH	543mm	543mm	543mm	610mm	610mm

S800-NJ

Plug-in conversion kits available



Dimensions

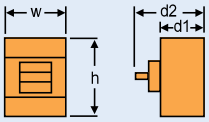
50kA Adjustable Settings Rated Voltage: 690VAC

3-Pole	S400-NJ	S630-CE	S800-NJ	S800-NE	S1000-SE	S1250-SE
4-Pole	S400-NJ4	S630-CE4	S800-NJ4	S800-NE4	S10000-SE4	S1250-SE4
Nominal Current Ratings S & E: -5 to 50°C 2000m XS: -5 to 40°C 2000m	**400A** (250-400)	**630A** (250-630)	**800A** (500-800)	**800A** (500-800)	**1000** (630-10000)	**1250** (630-1250)
		NEW	NEW	NEW	NEW	NEW
Ratings: Ui / Ue	800/690V	800/690V	690/690V	800/690V	800/690V	800/690V
Ics 400/415V	50kA	50kA	25kA (415°)	50kA (415°)	50kA (415°)	50kA (415°)
Icu/Ics 525V	30kA	30kA	35kA/18kA	35kA/18kA	35kA/18kA	35kA/18kA
Protection: Thermal	0.63-1 x In	Electronic	0.63-1 x In	Electronic	Electronic	Electronic
Magnetic	6-12 x In		3-12 x In			
Dimensions: h	260mm	260mm	273mm	273mm	273mm	370mm
d1	103mm	103mm	103mm	103mm	103mm	120mm
d2	145mm	145mm	145mm	145mm	145mm	171mm
w-3P	140mm	140mm	210mm	210mm	210mm	210mm
w-4P	185mm	185mm	280mm	280mm	280mm	280mm
Max Panel depth with VDH	610mm	610mm	484mm	484mm	484mm	515mm

TEMBREAK MCCB's

S250-GJ

Plug-in conversion kits available

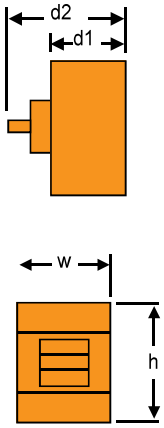


Dimensions

65kA - Adjustable settings Rated Voltage: 690VAC

3-Pole	S125-GJ	S160-GJ	S250-GJ	S400-GJ	S630-GE
4-Pole	S125-GJ4	S160-GJ4	S250-GJ4	S400-GJ4	S630-GE4
Nominal Current Ratings -5 to 50°C 2000m	**020A** (12.5-20)	**160A** (100-160)	**200A** (126-200)	**400A** (250-400)	**630A** (250-630)
	032A (20-32)		**250A** (160-250)		
	050A (32-50)				
	063A (40-63)				
	100A (63-100)				
	125A (80-125)				
Ratings: Ui / Ue	800/690V	800/690V	800/690V	800/690V	800/690V
Ics/Isu 415/400	36kA/65kA	36kA/65kA	36kA/65kA	50kA/70kA	50kA/70kA
Icu/ Ics 525V	25kA/22kA	25kA/25kA	25kA/25/kA	30kA/30kA	30kA/30kA
Protection: Thermal	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	Electronic
Magnetic	6-12 x In	6-13 x In	6-13 x In	6-12 x In	
Dimensions: h	155mm	165mm	165mm	260mm	260mm
d1	68mm	68mm	68mm	103mm	103mm
d2	92mm	92mm	92mm	145mm	145mm
w-3P	90mm	105mm	105mm	140mm	140mm
w-4P	120mm	140mm	140mm	185mm	185mm
Panel depth with VDH	543mm	543mm	543mm	610mm	610mm

S1600-GE

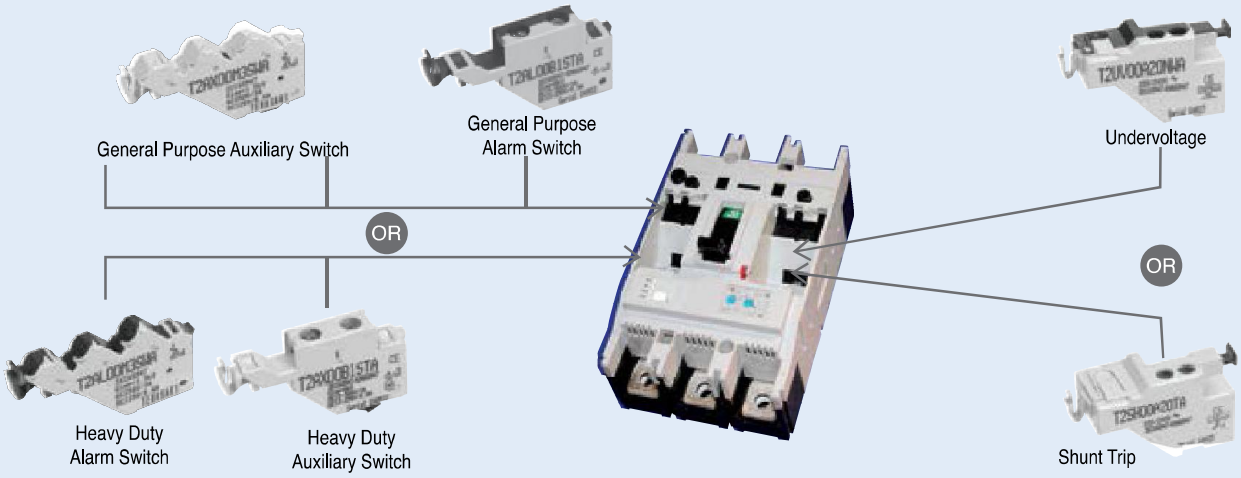


Dimensions

85kA - Adjustable settings / 100kA - Adjustable settings

3-Pole	S1250-NE	S1600-NE
4-Pole	S1250-NE4	S1600-NE4
Nominal Current Ratings -5 to 50°C 2000m	**1250A** (630-1250) NEW	**1600A** (800-1600) NEW
Ratings: Ui / Ue	800/690V	800/690V
Ics/Icu 415V	50kA/65kA	65kA/85kA
Icu/ Ics 525V	45kA/34kA	65kA/50kA
Protection: Thermal	Electronic	Electronic
Magnetic		
Dimensions: h	370mm	370mm
d1	120mm	140mm
d2	171mm	191mm
w-3P	210mm	210mm
w-4P	280mm	280mm
Max panel depth with VDH	515mm	535mm

1) Front Mounting Field-Installable Accessories
2) Internal Accessories are common for TemBreak (20 - 630Amp) See pages 4 and 5
2) Internal Accessories are common for TemBreak Lite (15 - 250Amp) See page 1



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MCCB ACCESSORIES FOR TEMBREAK 2

Auxiliary Switches (AX)

Frame Size	125A	160 - 250A	400 - 630A	800A	1250 - 1600A
	E125	E250	E400	S800	S1250
	S125	S250	S400 / S630	S1000	S1600
Aux					
1 C/O	A000348	A000348	A000348	A000348	A000348
Rating		3A @ 240V		5A @ 250V 3A @ 500V	
N/O	A000300	A000300	A000300	A000300	A000300
N/C	A000317	A000317	A000317	A000317	A000317
Rating		4A @ 240V 1A @ 500V			

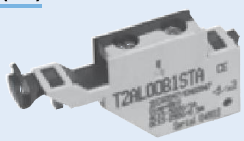
General purpose

Heavy Duty (AX)

Alarm Switches (AL)

Alarm					
1 C/O	A000744	A000744	A000744	A000744	A000744
Rating		3A @ 240V		5A @ 250V 3A @ 500V	
N/O	A000706	A000706	A000706	A000706	A000706
N/C	A000713	A000713	A000713	A000713	A000713
Rating		4A @ 240V 1A @ 500V			

General purpose



Heavy Duty (AL)

Shunt Trips (SHT)

125 - 630A 800 - 1600A

AC100 - 120V	S000904	S000904	S000904	S000904	S003905
AC200 - 240V	S000911	S000911	S000911	S000911	S003912
AC380 - 450V	S000928	S000928	S000928	S000928	S003929
AL/DC 12V	S000973	S000973	S000973	S000973	
DC 24V	S000935	S000935	S000935	S000935	S003936

Other voltages available ex-indent

Undervoltage Trips (UVT)

Instantaneous Type
125 - 630A

500mS
800 - 1600A

AC100 - 120V	U001208	U001208	U001208	U002304	U002304
AC200 - 240V	U001215	U001215	U001215	U002311	U002311
AC380 - 450V	U001222	U001222	U001222	U002328	U002328
DC 24V	U001239	U001239	U001239	U002335	U002335
100 - 110V	–	–	–	U003127	U003233
200 - 220V	–	–	–	U003134	U003240

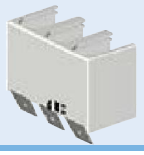
Other voltages available ex-indent

Covers

	125A	160 - 250A	400 - 630A	800A	1250A-1600A
Terminal covers for Front Connection 3P 1 off	C080425	C080456	C080807	C081040	C081088 (1off)
Terminal covers for Front Connection 4P 1 off	C080432	C080463	C080814	C081057	C081095 (1off)
Interpole Barriers 2 Pieces per 3P MCCB	C043062	C043161	C043338	C043338	C043338 (1off)
Door Flange	C044908	C044908	C045400		C211005161

Terminal Extention Bars

Frame Size	Description	125A	160 - 250A	400A	630A	800A
3 Bars Straight	3 Bars Straight Type	E010026	E010408	E010415	E010415	E215003359
4 Bars Straight	4 Bars Straight Type	E010040	E010163	E010422	E010422	E215003360
3 Bars Offset	3 Bars Off Set Type		E010149	E010323	E010323	–
4 Bars Offset	4 Bars Off Set Type			E010330	E010330	–



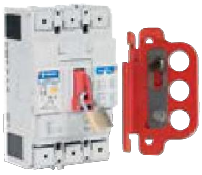
Terminal Cover

Interpole Barrier

Door Flange

MCCB ACCESSORIES FOR TEMBREAK 2

External Operating Handles		Frame Size	125A	160 - 250A	400 - 630A	800A	1250A	1600A
Door Mount IP55	Black Daros Handle		120-45-0200-01	120-45-0200-01	121-45-0202-01	121-45-0204-01	121-45-0206-01	121-45-0208-01
Door Mount IP55	Black Handle		H727993	H728952	H729911	H061240	H061325	H061325
Door Mount IP65	Black Handle		H728037	H728990	H729959	H061288	H061363	H061288
Breaker Mount			H725623	H726347	H727061	H027079	H027543	H027543
Padlock Attachment	Handle Locks		H037016	H037016	H037207	–	H035326	H035326
Padlock Attachment	Slide Locks + Hat Stand		TLSB-125	TLSB-250	TLSB-630	TLSB-800	–	–


Padlock Attachments

Breaker Mount

Toggle lock slide bracket

Door Mount Handle IP65

Symmetrical mount

Daros Handles IP54

Chain Drive Mechanism for larger MCCBs

Motor Operators

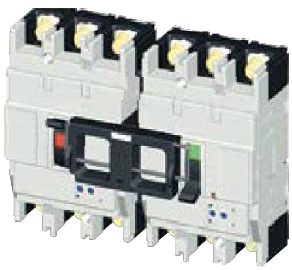
To fit TB2 MCCBs

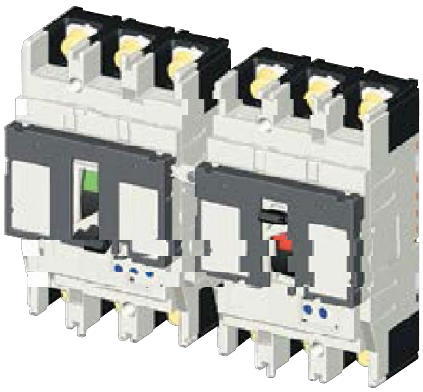
	125A	160 - 250A	400 - 630A	800A / 1000A	1250A-1600A
AC100-110V	MO755606	MO755705	–	–	MO735332
AC 100-240V	–	–	MO756009	MO735400	–
AC 230 - 240V	MO755620	MO755729	–		MO735349 (200-230VAC)
DC 24V	MO755637	MO755736	MO756016	MO735417 (DC24-48)	MO735363 (DC24V)

Mechanical & Electrical Interlocks	125A	160 - 250A	400 - 630A	800A / 1000A	1250A	1600A
Slide Type Mechanical Interlocks (*1) 3P	M033513	M033605	M033704	M033803	M035302	M035302
Slide Type Mechanical Interlocks (*1) 4P	M033520	M033612	M033711	M033810	M035319	M035319
Link Type Mechanical Interlocks Right Side (*2)	M035005	M035104	M035265	M036309	TBA	TBA
Link Type Mechanical Interlocks Left Side 3P (*2)	M035012	M035111	M035272	M036316	TBA	TBA
Link Type Mechanical Interlocks Left Side 4P (*2)	M035029	M035128	M035289	M036323	TBA	TBA
Cable Type Mechanical Interlocks Interlock (*2)	M036026	M036125	M036248	M036330	TBA	TBA
Cable Type Mechanical Interlocks 1m Length Interlock Cable (*2)	M036064	M036064	M036064	M036064	TBA	TBA
Cable Type Mechanical Interlocks 1.5m Length Interlock Cable (*2)	M036057	M036057	M036057	M036057	TBA	TBA

† Note: Mechanical Interlocks to be assembled by our workshops

(*1) *Order one part between two MCCBs*
(*2) *Order one Interlock part for each MCCB*


Slide Type
(only manual operated)


Link Type

Cable Type

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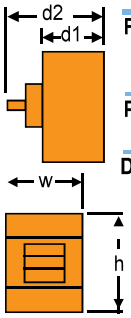
MCCB's & ACCESSORIES

XS1250SE



Dimensions

		3-Pole	XS800-NJ	XS1250-CE	XS1250-SE	XS1600-SE	XS2000-SE
		4-Pole	XS800-NJ4		XS1250-SE4	XS1600-SE4	–
Nominal Current Ratings -5 to 50°C 2000m			**800A** (500-800)	**1000A (500-1000A)**	**1250A** (630-1250)	**1600A** (800-1600)	**2000A** (1000-2000)
				1250A (630-1250)			
Ratings	Ui / Ue		690/690V	690/690V	800/690V	800/690V	800/690V
	Ics/Icu 415V		50kA/25kA(415v)	50kA/25kA(415v)	50kA/65kA	65kA/85kA	100kA
	Icu/ Ics 525V		35kA/18kA	35kA/18kA	45kA/34kA	65kA/50kA	
Protection	Thermal		0.63-1 x In	Electronic	Electronic	Electronic	Electronic
	Magnetic		3-12 x In				
Dimensions	h		273mm	370mm	370mm	370mm	450mm
	d1		103mm	120mm	120mm	140mm	225mm
	d2		145mm	171mm	171mm	191mm	285mm
	w-3P		210mm	210mm	210mm	210mm	-
	w-4P		280mm	280mm	280mm	280mm	-
Max panel depth with VDH			484mm	515mm	515mm	535mm	320 mm

ACCESSORIES

Door Mount Handle **IP65**

Symmetrical mount

Daros Handles **IP54**

Chain Drive Mechanism for larger MCCBs

Description	800A	1250A	1600A
Door Mount **IP55**	121-45-0204-01	121-45-0206-01	121-45-0208-01
Door Mount **IP55**	H061240	H061325	H061325
Door Mount **IP65**	H061288	H061363	H061288
Breaker Mount	H027079	H027543	H027543
Padlock Attachment	H215011004	H211011005	H211011005
Padlock Attachment	TLSB-800	–	–

Motor Operators

To fit TB2 MCCBs

To fit XS MCCBs

Description	800A	1250A-1600A
AC100-110V	–	–
AC 100-240V	–	–
AC 230 - 240V	MO215008024	MO212008025
DC 24V	MO215008054	MO212008055

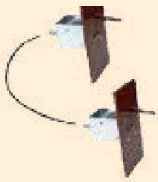
Other voltages available ex-indent

Mechanical & Electrical Interlocks

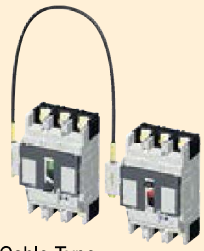
Description	800A	1250A	1600A
Slide Type Mechanical Interlocks	M211009023	M211009007	M211009007
Front Rear Connection 3P (*1)		M211009008	M211009008
Slide Type Mechanical Interlocks			
Front Rear Connection 4P (*1)			
Link Type Mechanical Interlocks Right Side (*2)			
Link Type Mechanical Interlocks Left Side 3P (*2)			
Link Type Mechanical Interlocks Left Side 4P (*2)			
Cable Type Mechanical Interlocks Interlock (*2)			
Cable Type Mechanical Interlocks 1m Length Interlock Cable (*2)	M21500935		
Cable Type Mechanical Interlocks 1.5m Length Interlock Cable (*2)			
Rear Mechanical Interlock Toggle Type	M215009023	M211009025	M211009027
Rear Mechanical Interlock Cable Type	M215009035	M211009036	M211009037

(*1) *Order one part between two MCCBs* **(*2)** *Order one Interlock part for each MCCB*

Rear Toggle Type



Rear Mech. Cable



Cable Type

Electrical Type

Toggle Type

Link Type

Slide Type

MCCB ACCESSORIES FOR TEMBREAK 2

Auxiliary Switches (AX)

Frame Size	800A	1250 - 1600A
	XS800	XS1250
		XS1600
1 C/O	A215001005	A212001006
2 C/O	A215001015	A212001016
3 C/O	A215001025	A212001026
Rating	5A @ 250V 3A @ 500V	

Undervoltage Trips (UVT)

AC100 - 120V	U215002067	U212002068
AC200 - 240V	U215002075	U212002076
DC 24V	U215002093	
AC100 - 120V	U215002119	U2120022120
AC200 - 240V	U215002127	U212002128

Other voltages available ex-indent

Alarm Switches (AL)

	1 C/O	A215001070	A212001071
1 C/O	1 C/O	A215001042	A212001043
Rating	5A @ 250V 3A @ 500V		

Shunt Trips (SHT)

	–		S212002007
AC380 - 450V	–		S121002015
DC 12V	–		S212002015
DC 24V	S215002032		S212002033

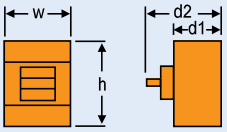
800 - 1600A

Covers

Description	800A	1250A-1600A
Terminal covers for Front Connection 3P 2 covers	C215004015	C211004020
Interpole Barriers 2 Pieces per 3P MCCB	C215004042	C211004042
Door Flange	C215005160	C211005161

ISOLATORS

3 Pole Isolator	S125-NN	S160-NN	S250-NN	S400-NN	S630-NN	XS800-NN	XS1250-NN
4 Pole Isolator Early make, Late break Neutral	S125-NN4	S160-NN4	S250-NN4	S400-NN4	S630-NN4	XS800-NN4	XS1250-NN4
Terasaki Professional Switching Solutions 100% Rated Neutral For more economical 160A or 250A isolators, see page 1.							
Rated Current Amps	125A	160A	250A	400A	630A	800A	1250A
Rated Voltage Ue AC	690V	690V	690V	690V	690V	690V	690V
Rated short circuit making capacity Peak	3.6kA	6kA	6kA	9kA	9kA	15kA	32kA
Rated short time current 0.3 Secs	2kA	3kA	3kA	5kA	5kA	9.6kA	15kA
Dimensions							
w - 3 Pole	90mm	105mm	105mm	140mm	140mm	210mm	210mm
w - 4 Pole	120mm	140mm	140mm	185mm	185mm	280mm	280mm
h	155mm	165mm	165mm	260mm	260mm	273mm	370mm
d1	68mm	68mm	68mm	103mm	103mm	103mm	120mm
d2	92mm	92mm	92mm	145mm	145mm	145mm	171mm
For accessories see CB	S125-NJ	S160-NJ	S250-NJ	S400-NJ	S630-NE	XS800-NJ	XS1250-SE
Back-Up Circuit Breaker	S125-NJ	S160-NJ	S250-NJ	S400-NJ	S630-NE	XS800-NJ	–
Maximum switching current AC	750A	1000A	1500A	2400A	3780A	4800A	7500A



MOTORISED INTERLOCKED MCCB's

Motorised, Electrical & Mechanically interlocked

- 160 - 800kVA
- Ideal for gensets
- One part number

Each set comprises:

2 x 3-pole MCCBs
2 x Motor operators
2 x Aux interlocks
1 x Mechanical interlock set

Other combinations involving circuit breakers and isolators can be assembled to your order.

		Code	EEM125*	EEM250*	EEM400*	EEM630*	XSM800*	XSM1250*	XSM1600*
			Supplied in kit format				Workshop Assembly		
Ratings	Voltage	Ue	525V	525V	690V	690V	690V	690V	690V
	Current	In	125A	250A	400A	600A	500-800A	630-1250A	800-1600A
	Gensets	Icu 400/415	80kVA	160kVA	250kVA	400kVA	450-500kVA	550-850kVA	500-1000kVA
Overload Protection			25kA	25kA	36kA	36kA	65kA	85kA	100kA
		Thermal	0.63-1 x In	0.63 - 1 x In	0.63 - 1 x In	0.63 - 1 x In	Adj. 63-1 x In	Electronic	Electronic
		Instant	Adj. 6-12 x In	Adj. 6-12 x In	Adj.6-12 x In	Electronic	Adj. 5-10 x In	Electronic	Electronic
Description		Qty							
Moulded Case MCCB		2	E125-NJ 125A	E250-NJ 250A	S400-CJ 400A	E630-NE 630A	–	–	–
Motor Operator		2	Refer to page 5 for part number + voltage of motor						
Auxiliary Switch		2	A000317	A000317	A000317	A000317	–	–	–
RHS Mechanical Interlock Link Type		1	M035005	M035104	M035265	M035265	–	–	–
LHS Mechanical Interlock Link Type		1	M035012	M035111	M035272	M035272	–	–	–
Dimensions:		w	240	270	340	340	420	420	?
		h	155	165	260	260	340	530	?
		d	170	170	233	233	300	360	?
For accessories & further specs, see CB			E125	E250	S400	E630	XS800	XS1250	?

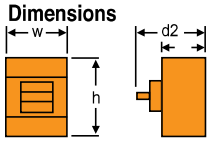
** Add Control Voltage for Motorised Operators :**230VAC** or **24VDC** eg **EEM400 230VAC***

TEMBREAK MINING 1100V MCCB's

Series VS

Note: Refer to Page 6 & 7 for accessories

3-Pole		NEW VS/25-NJ	NEW VS250-NJ
	Current Rating In	**020A** (12.5-20) 4kA	**250A** (160-250)
		032A (20-32) 4kA	
		050A (32-50) 4kA	
		063A (40-63) 6kA	
		100A (63-100) 6kA	
		125A (80-125) 6kA	
AC Breaking Capacity:	Icu 1100V	4/6kA	6kA
Protection:	Thermal	Adj 0.63-1 x In	Adj 0.63-1 x In
	Magnetic (Inst.)	Fixed 13 x In	Fixed 13 x In
Dimensions	h	155mm	165mm
	d1	68mm	68mm
	d2	92mm	140mm
	w	90mm	105mm
	Max depth with VDH	373mm	390mm

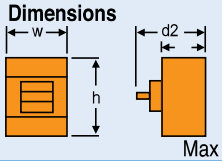


Note: Refer to Page 6 & 7 for accessories

TEMBREAK MINING 1100V MCCB's

Series XV

3-Pole	XV125-NJ	XV250-NJ	XV400-NE	XV630-PE	XV800-NE
Current Rating In	**020A** (12.5-20) 4kA	**250A** (160-250)	**250A** (125-250)	**630A** (315-630)	**800A** (400-800)
	032A (20-32) 4kA		**400A** (200-400)		
	050A (32-50) 4kA				
	063A (40-63) 6kA				
	100A (63-100) 6kA				
	125A (80-125) 6kA				
AC Breaking Capacity: Icu 1100V	4/6kA	6kA	12.5kA	18kA	18kA
Protection: Thermal	Adj 0.63-1 x In	Adj 0.63-1 x In	Electronic	Electronic	Electronic
Magnetic (Inst.)	Fixed 13 x In	Fixed 13 x In			
Dimensions h	155mm	165mm	260mm	273mm	273mm
d1	86mm	103mm	103mm	103mm	103mm
d2	104mm	124mm	145mm	145mm	145mm
w	90mm	105mm	140mm	210mm	210mm
Max depth with VDH	373mm	390mm	385mm	385mm	385mm



Accessories

Auxiliary contacts (Ax)
Auxiliary = Aux
Alarm (Trip only) = Alarm

Frame Size		125A	160-250A	400A	600-800A
Aux	Alarm				
1 C/O	–	A211001002	A212001003	A212001004	A215001005
2 C/O	–	A211001012	A212001013	A212001014	A215001015
3 C/O	–	–	–	A212001024	A215001025
–	1 C/O	A212001067	A212001068	A212001069	A215001070
1 C/O	1 C/O	A212001039	A212001040	A212001041	A215001042
Rating		3A @ 250V; 0.4A @ 500V		5A @ 250V; 3A @ 500V	

Undervoltage Trips (UVT)

		125A	160-250A	400A	600-800A
Inst:	100-120VAC	U212002064	U212002065	U211002066	U215002067
	200-240VAC	U212002072	U212002073	U211002074	U215002075
500mS	100-120VAC	U212002116	U212002117	U211002118	U215002119
	200-240VAC	U212002124	U212002125	U211002126	U215002127
	Other voltages available ex-indent.		24VDC UVT		

Shunt Trips (SHT)

	125A	160-250A	400A	600-800A
100-115VAC	S212002003	S212002004	S211002005	S215002006
200-480VAC	S212002011	S212002012	S211002013	S215002014
24VDC	S212002029	S212002030	S212002031	S215002032
Other voltages available ex-indent.				

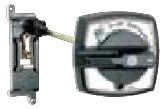
		125A	160-250A	400A	600-800A
Covers	Terminal Covers 3 Pole (set of 2)	C212004006	C211004010	C212004016	C215004018
	Interpole Barriers (set of 2)	C211004038	C211004040	–	C215004042
	Door flange	C211005159	C211005159	C211005160	C215005160
Mechanical Interlocks 220 - 230VAC	Rear Toggle	M211009015	M211009017	M211009021	M211009023
	1m cable	–	–	M211009034	M215009035

Rear Toggle Type
Mechanical Interlock
Shown fitted to **XEM800**

Front Cable Type

Rear Cable Type

Handle Mechanisms



	125A	160-250A	400A	600-800A
Padlock attachment	H211011001	H211011002	H212011003	H215011004
Varidepth handle IP45	120TEC.8165	120TEC.8265	121TEC.8365	121TEC.8465 (600A)
DAROS				800A 121-45-0204-01

Motor Operators

Motor Operator	**230VAC**	MO215008024	MO212008025
Motor Operator	**24VDC**	MO215008054	MO212008055

ON control. Closing spring is electrically released and the MCCB closes.
OFF control. MCCB opens and motor recharges the closing spring.
RESET control. When MCCB is tripped, switching the MCCB OFF starts the motor which recharges the closing spring and resets the MCCB to the OFF position.
Manual operation remains available. MCCB can be padlocked in OFF position

Motor Operator – spring charged
(shown fitted to circuit breaker)

Maximum Configurations

Accessory	MCCB 100-250A	MCCB 400-1600A
Shunt or UVT	1	1
Alarm	1	1
Auxiliary	2	3
Alarm + Auxiliary	1 1	1 2

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MCCB's WITH INTEGRATED EARTH LEAKAGE PROTECTION

240-525VAC Suitable for Single Phase installation

	3-Pole	ZE125-NJ	ZS125-NJ	ZS125-GJ	ZE250-NJ	ZS250-NJ	ZS250-GJ
	4-Pole	ZE125-NJ4	ZS125-NJ4	ZS125-GJ4	ZE250-NJ4	ZS250-NJ4	ZS250-GJ4
	Current	**020A** (12.5-20)	**020A** (12.5-20)	**020A** (12.5-20)	**250A**	**250A**	**250A**
	Rating	**032A** (20-32)	**032A** (20-32)	**032A** (20-32)	(160-250)	(160-250)	(160-250)
	In	**050A** (32-50)	**050A** (32-50)	**050A** (32-50)			
		063A (40-63)	**063A** (40-63)	**063A** (40-63)			
		100A (63-100)	**100A** (63-100)	**100A** (63-100)			
		125A (80-125)	**125A** (80-125)	**125A** (80-125)			
AC Breaking Capacity	Icu 400V/415V	25kA	36kA	65kA	25kA	36kA	65kA
	525V	8kA	22kA	25kA	10kA	25kA	25kA
Protection	Earth Leakage	30mA - 3A	30mA - 3A	30mA - 3A	30mA - 3A	30mA - 3A	30mA - 3A
	Thermal	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In
	Magnetic Fixed	10-12 x In	10-12 x In	10-12 x In	10-13 x In	10-13 x In	10-13 x In
Dimensions	see CB	E125	S125	S125	E250	S250	S250

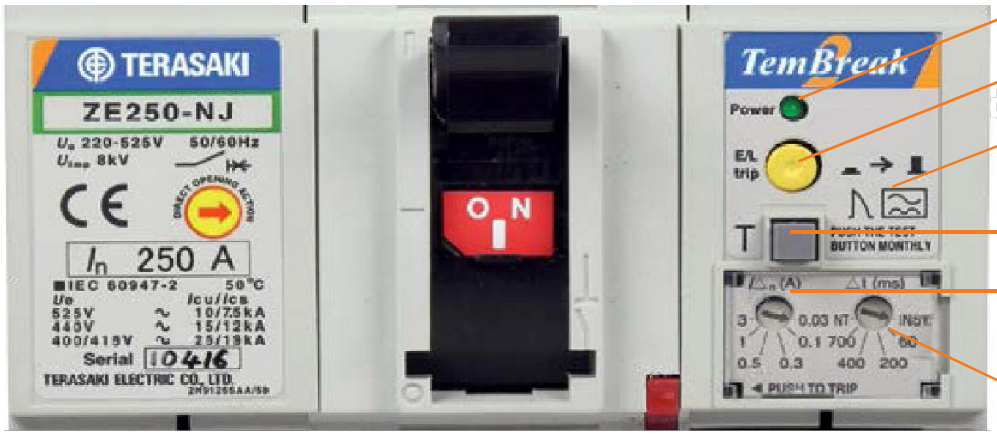
MCCB'S with Intergral Earth LEAKAGE & Remote Trip & Alarm Feature
Adjustable Undervoltage Feature Selectable 50% or 70%

NEW

	3-Pole	ZE125-NJ ZI	ZS125-NJ ZI	ZS125-GJ ZI	ZE250-NJ ZP	ZS250-NJ ZP	ZS250-GJ ZP
	4-Pole	ZE125-NJ4 ZI	ZS125-NJ4 ZI	ZS125-GJ4 ZI	ZE250-NJ4 ZP	ZS250-NJ4 ZP	ZS250-GJ4 ZP
	Current	**020A** (12.5-20)	**020A** (12.5-20)	**020A** (12.5-20)	**250A**	**250A**	**250A**
	Rating	**032A** (20-32)	**032A** (20-32)	**032A** (20-32)	(160-250)	(160-250)	(160-250)
	In	**050A** (32-50)	**050A** (32-50)	**050A** (32-50)			
		063A (40-63)	**063A** (40-63)	**063A** (40-63)			
		100A (63-100)	**100A** (63-100)	**100A** (63-100)			
		125A (80-125)	**125A** (80-125)	**125A** (80-125)			
AC Breaking Capacity	Icu 400V/415V	25kA	36kA	65kA	25kA	36kA	65kA
	525V	8kA	22kA	25kA	10kA	25kA	25kA
Protection	Earth Leakage	30mA - 3A	30mA - 3A	30mA - 3A	30mA - 3A	30mA - 3A	30mA - 3A
	Thermal	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In	0.63-1 x In
	Magnetic Fixed	10-12 x In	10-12 x In	10-12 x In	10-13 x In	10-13 x In	10-13 x In
Dimensions	see CB	E125	S125	S125	E250	S250	S250

Note: This range can only accommodate one alarm and two auxillary contact blocks, no shunts or UVTs can be fitted.

MCCB's WITH INTEGRATED EARTH LEAKAGE PROTECTION



- Voltage presence LED
- Trip indicator
- Type A tripping for greatest accuracy of protection.
- Test button
- Selectivity: 30mA, 100mA, 300mA, 500mA, 1A or 3A
- Adjustable time delay: 60,200, 400 or 700ms

For Accessories see page 6 & 7

NOTE: No shunt or UVT's can be fitted. Only 2 x AUX & 1 x AL contact blocks

EARTH FAULT RELAYS

contrel

Type	DIN Mount 70mm	Base Mount Internal CT	Panel Mount 96 x 96		Panel Mount 96 x 96 3 Digit Display
Code	ELR-3C†	Ø 35 mm **ELRC-1/35**	ELR-1†	*ELR-M2S†	DER2/V†
		Ø 60 mm **ELRC-1/60**	*With mechanical trip indicator and alarm relay*		DER2/VM†
		Ø 80 mm **ELRC-1/80**			*with 10 day memory for actual tripping current*
		Ø 110 mm **ELRC-1/110**			
Output Relay	Trip only	Trip only 400V	Trip only	Trip & Alarm	Trip & Pre Alarm
Supply Volts	110VAC/DC, 230/400VAC				110/230/400VAC or 525VAC

Features

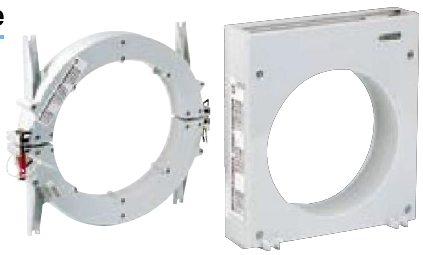
- Selectable current threshold adjustable 0.025mA - 25A
- Trip delay adjustable 0.025 to 5 seconds
- Test pushbutton
- Reset pushbutton
- Relay output 5A @ 250VAC
- Standards IEC 255, IEC947.7

For motor protection, 75kW and above, time delay is always required.

† Select one CT below for use with one relay.

Toroidal transformers supplied separate

The toroidal current transformer to be coupled to any of the above (†) marked relays.
Has two separate windings:
Test and monitor.



Closed	Ø	Split-type
CT-1/35	35mm	
CT-1/60	60mm	CTA-1/60
CT-1/80	80mm	
CT-1/110	110mm	CTA-1/110
CT-1/160	160mm	CTA-1/160
CT-1/210	210mm	CTA-1/210

AIR CIRCUIT BREAKERS & ACCESSORIES

TemPower2

The TemPower2 is the world's first "Double Break" ACB, having two breaking contacts per phase. The unique pole structure means that the short time withstand rating (Icw, 1sec) is equal to the service short-circuit breaking capacity (Ics) for all models.

TemPower2 ACBs have the world's smallest depth resulting in space saving in switchboards.

Features

- One of the smallest ACBs in the world.
- Double contact breaking system. Fast clearing time of 30 msec.
- Double insulated front body, field fit accessories.
- Icu = Ics = Icw. 65kA, 85kA, 100kA and 120kA versions.
- Characteristic curve to IEC 60255-3. True generator protection curves in accordance with Marine Classification Rules.
- Monitoring of contact temperature.
- Reverse power protection. Zone Interlocking Unrestricted and/or restricted ground fault protection.
- Double opening and closing coils.
- All standard voltage options are available for protection relays.
- Withdrawable plug-in version - main clusters fitted to ACB, not to cradle.

Benefits

- Reducing switchboard size and cost.
- Increase reliabilty and extendad life under fault conditions
- Facilitates simple maintenance, upgrade and retro fitting.
- High short circuit withstand provides full selectivity up to 100kA and means no reduction of performance when tripped by an external relay.
- The most flexible relay on the market ensures selectivity and protection are always achieved.
- Provides diagnostic information and reduces factory down time.
- Integrated generator protection functions within the one relay.

- Increased reliability for critical applications. Increased Redundantly.
- No additional cost or configuration.
- Clusters can be maintained without mains being switched off.

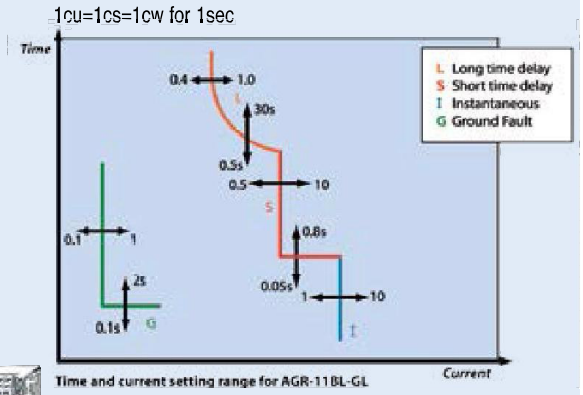
AIR CIRCUIT BREAKERS - FIXED & DRAWOUT

Simplified Ordering

Standard part number Includes

- Protection Relay LSI (AGR-11BL-AL)
- Dial Type-2 (LCD available on request)
- 4 AB Auxiliary Contacts
- Padlockable Mechanical Close & Open Buttons
- Mechanical Close & Open Indicators
- Mechanical Indicator for Charged/Discharged State
- Position Indicator

1250A



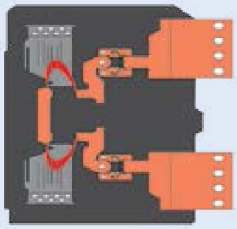
Time and current setting range for AGR-11BL-GL

Drawout Only

- Drawout Handle
- Horizontal or Vertical Connections
- Chassis
- Safety Shutters
- Terminal Cover

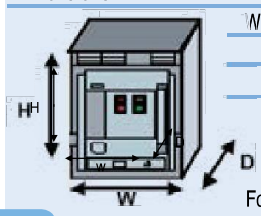
6300A

Double Break Contacts



4 Pole ACBs available on request

		Fixed Type			Drawout Type		
ACB Frame Size		AR 2	AR3	AR 2	AR3	AR 4	AR6
Rated Current	In	1250 / 1600 / 2000A	2500 / 3200A*	1250* / 1600 / 2000A	2500 / 3200A*	4000A*	5000* / 6300A*
ACB Model 3 pole		ACDC2F312HH	ACDC3F325VV	ACDC2D312HH*	ACDC3D325VV	ACDC4D340VV	ACDC6D350VV*
-5 - 40°C		ACDC2F316HH	ACDC3F332VV*	ACDC2D316HH	ACDC3D332VV*	–	ACDC6D363VV*
		ACDC2F320VV	–	ACDC2D320VV	–	–	–
Rated Operational Voltage	Ue	690V	690V	690V	690V	690V	690V
AC Rated Insulation Voltage	Ui	1000V	1000V	1000V	1000V	1000V	1000V
Ics Service Breaking Capacity							
(kA, symmetrical r.m.s)	690V	50	65	50	65	85	85
	440V	65	85	65	85	100	120
	400/415V	65kA	85kA	65kA	85kA	100kA	120kA
Icm Making Capacity							
(kA, asymmetrical peak)	690V	105	143	105	143	187	187
	440V	143	187	143	187	220	264
	400/415V	143	187	143	187	220	264
Icw Short - Time Withstand							
(kA rms)	1 sec	65	85	65	85	100	120
	3 sec	50	65	50	65	75	85
Endurance (Number of operating cycles)							
Mechanical (C/W maintenance)		30000	20000	30000	20000	15000	40000
Mechanical (W/O maintenance)		15000	10000	15000	10000	8000	5000
Electrical (C/W maintenance AC460V)		12000	7000	12000	7000	3000	1000
Electrical (W/O maintenance AC460V)		10000	5000	10000	5000	2500	500
Times							
Total Breaking Time (sec) max		0.03	0.03	0.03	0.03	0.03	0.05
Spring Charging Time (sec) max		10	10	10	10	10	10
Closing Time (sec) max		0.08	0.08	0.08	0.08	0.08	0.08
Dimensions							
	W 3 pole	360mm	466mm	354mm	460mm	460mm	799mm
	H	460mm	460mm	460mm	460mm	460mm	460mm
	D	290mm	345mm	345mm	345mm	380mm	380mm



For other configurations, contact AC/DC technical support

* *Available Ex-Indent*

ACCESSORIES

MECHANICAL INTERLOCK KITS - Cable Type. Interlocking is possible between any frame sizes within the Tempower2 range

2-Way Vertical

Code	116311906

For vertical interlocking 2 ACB's 800mm pitch (includes connecting rods for 800mm pitch).

Type-A - GENERATOR INTERLOCKED WITH 2 MAINS SUPPLIES MAINS NOT INTERLOCKED FOR HORIZONTAL INTERLOCKING 3 ACB'S

Code	116311609

Generator interlocked with 2 mains (incl. 2 cables for 1000mm & 2 for 2000mm pitches). Generator ACB positioned on left-hand side or right-hand side.

Type-B Two - 2 MAINS & 1 BUS COUPLER

Code	116311908

For horizontal interlocking 3 ACB's, 2 ACB's can be closed. (incl. 4 cables for 1000mm & 2 for 2000mm pitches.)

Type-C Horizontal

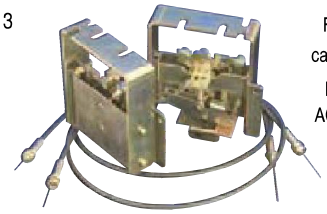
Code	116311907

For horizontal interlocking 2 ACB's. Pitch 1000mm. (includes 2 cables 1000mm pitch 1520mm long).

Type-D - ONLY 1 ACB CAN BE CLOSED OUT OF 3

Code	116311909

For horizontal interlocking 3 ACB's, one can be closed (includes 4 cables 1000mm & 2 for 2000mm pitches).



For other pitch/ cable/ rod lengths, please contact AC/DC Dynamics

Code	Description
DRAWOUT CHASSIS	
ACDC2C316HH	AR216SC 3P HC/HC CHASSIS. Standard Specification
ACDC2C320VV	AR220SC 3P VC/VC CHASSIS. Standard Specification
ACDC3C325VV	AR325SC 3P VC/VC CHASSIS. Standard Specification
Safety shutters fitted as standard	
MOTOR OPERATORS	
116103106	AC110V AGR-1B MOTOR UNIT. 208-220
116103107	AC220V AGR-1B MOTOR UNIT. 208-220
116103108	AC240V AGR-1B MOTOR UNIT. 208-220
116103109	AC380/440V AGR-1B MOTOR UNIT. 208-220
116103103	DC110V AGR-1B MOTOR UNIT. 208-220
116103104	DC125V AGR-1B MOTOR UNIT. 208-220
116103105	DC220V AGR-1B MOTOR UNIT. 208-220
116103101	DC24V AGR-1B MOTOR UNIT. 208-220
116103102	DC48V AGR-1B MOTOR UNIT. 208-220
116103111	DC24V AGR-1B MOTOR UNIT. 325-440
116103112	DC48V AGR-1B MOTOR UNIT. 325-440
116103113	DC110V AGR-1B MOTOR UNIT. 325-440
116103114	DC125V AGR-1B MOTOR UNIT. 325-440
116103115	DC220V AGR-1B MOTOR UNIT. 325-440
116103116	AC110V AGR-1B MOTOR UNIT. 325-440
116103117	AC220V AGR-1B MOTOR UNIT. 325-440
116103118	AC240V AGR-1B MOTOR UNIT. 325-440
116103119	AC380/440V AGR-1B MOTOR UNIT. 325-440
116103301	DC24V AGR-2B,3B MOTOR UNIT. 208-220
116103302	DC48V AGR-2B,3B MOTOR UNIT. 208-220
116103303	DC110V AGR-2B,3B MOTOR UNIT. 208-220
116103304	DC125V AGR-2B,3B MOTOR UNIT. 208-220
116103305	DC220V AGR-2B,3B MOTOR UNIT. 208-220
116103306	AC110V AGR-2B,3B MOTOR UNIT. 208-220
116103307	AC220V AGR-2B,3B MOTOR UNIT. 208-220
116103308	AC240V AGR-2B,3B MOTOR UNIT. 208-220
116103309	AC380/440V AGR2B,3B MOTOR UNIT. 208-220
116103311	DC24V AGR-2B,3B MOTOR UNIT. 325-440
116103312	DC48V AGR-2B,3B MOTOR UNIT. 325-440
116103313	DC110V AGR-2B,3B MOTOR UNIT. 325-440
116103314	DC125V AGR-2B,3B MOTOR UNIT. 325-440
116103315	DC220V AGR-2B,3B MOTOR UNIT. 325-440
116103316	AC110V AGR-2B,3B MOTOR UNIT. 325-440
116103317	AC220V AGR-2B,3B MOTOR UNIT. 325-440
116103318	AC240V AGR-2B,3B MOTOR UNIT. 325-440
116103319	AC380/440V AGR2B,3B MOTOR UNIT. 325-440
CLOSING COILS	
116104106	AC110V CLOSING COIL

Code	Description
CLOSING COILS	
116104107	AC220V CLOSING COIL
116104108	AC240V CLOSING COIL
116104109	AC380/440V CLOSING COIL
116104103	DC110V CLOSING COIL
116104105	DC220V CLOSING COIL
116104101	DC24V CLOSING COIL
116104102	DC48V CLOSING COIL
116104104	DC125V CLOSING COIL
116104110	DC24V DOUBLE CLOSNG COIL Requires 2B External Aux SW
116104111	DC30V CLOSING COIL
116104112	AC240V DOUBLE CLOSING COIL Requires 2B External Aux SW
KEY LOCKS	
116108101	CYLINDER LOCK AND KEY
116108203	CASTELL LOCK AND KEY (Factory Fitted)
116133001	LOCK IN OFF POSITION
116108204	CATELL FACILITY
VERTICAL & HORIZONTAL THERMINALS	
116326005	208-12S 3P FIXED 1/2 SET VC.Vertical Terminals
116326011	216S 3P FIXED 1/2 SET VC. Vertical Terminals
116326015	220S 3P FIXED 1/2 SET HC. Horizontal Terminals
116326022	325-32S 3P 1/2 SET HC TOP. For Fixed ACB
116326023	325-32S 3P 1/2 SET HC BTM. For Fixed ACB
116226011	216S 3P DO 1/2 SET VC. Vertical Terminals
116226015	220S 3P DO 1/2 SET HC. Horizontal Terminals
116226022	325-32S 3P DO 1/2 SET HC TOP. Horizontal Terminals
116226023	325-32S 3P DO 1/2 SET HC BTM. Horizontal Terminals
116218001	MAIN SHUTTER/H 08-20 3P 1/2SET. Horizontal Connections
PROTECTION RELAYS (Standard Dial Type)	
116101103	AGR-11BL-AL
116101113	AGR-11BL-GL
116101403	AGR-11BL-ALN
116101413	AGR-11BL-GLN
PROTECTION RELAYS (Standard LCD Type)	
116101203	AGR-21BL-PS/A100*UN. AC100-120V/200-240V
116101205	AGR-21BL-PS DC24V/48V
116101240	AGR-22BS-PR AC. AC100-120V/AC200-240V
116101242	AGR-22BS-PR DC24V/48V
116101200	AGR-21BS-PS AC. AC100-120V/AC200-240V
116101201	AGR-21BS-PS DC. DC100-125V/DC200-250V
116101202	AGR-21BS-PS DC24V/48V
116101204	AGR-21BL-PS DC. DC100-125V/DC200-250V
116101206	AGR-21BR-PS AC. AC100-120V/AC200-240V
116101207	AGR-21BR-PS DC. DC100-125V/DC200-250V

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ACCESSORIES

Code	Description
PROTECTION RELAYS (Standard LCD Type)	
116101208	AGR-21BR-PS DC24V/48V
116101223	AGR-21BL-PG AC. AC100-120V/AC200-240V
116101224	AGR-21BL-PG DC. DC100-125V/DC200-250V
116101225	AGR-21BL-PG DC24V/48V
116101226	AGR-21BR-PG AC. AC100-120V/AC200-240V
116101227	AGR-21BR-PG DC. DC100-125V/DC200-250V
116101228	AGR-21BR-PG DC24V/48V
116101241	AGR-22BS-PR DC. DC100-125V/DC200-250V
116101503	AGR-21BL-PSN AC. AC100-120V/AC200-240V
116101504	AGR-21BL-PSN DC. DC100-125V/DC200-250V
116101505	AGR-21BL-PSN DC24V/48V
116101506	AGR-21BR-PSN AC. AC100-120V/AC200-240V
116101507	AGR-21BR-PSN DC. DC100-125V/DC200-250V
116101508	AGR-21BR-PSN DC24V/48V
116101523	AGR-21BL-PGN AC. AC100-120V/AC200-240V
116101524	AGR-21BL-PGN DC. DC100-125V/DC200-250V
116101525	AGR-21BL-PGN DC24V/48V
116101526	AGR-21BR-PGN AC. AC100-120V/AC200-240V
116101527	AGR-21BR-PGN DC. DC100-125V/DC200-250V
116101528	AGR-21BR-PGN DC24V/48V
PROTECTION RELAYS (Enhanced LCD Type)	
116101303	AGR-31BL-PS AC. AC100-120V/AC200-240V
116101305	AGR-31BL-PS DC24V/48V
116101309	AGR-31BS-PS AC. AC100-120V/AC200-240V
116101311	AGR-31BS-PS DC24V/48V
116101323	AGR-31BL-PG AC. AC100-120V/AC200-240V
116101326	AGR-31BR-PG AC. AC100-120V/AC200-240V
116101328	AGR-31BR-PG DC24V/48V
116101325	AGR-31BL-PG DC24/48V
116101304	AGR-31BL-PS DC. DC100-125V/DC200-250V
116101306	AGR-31BR-PS AC. AC100-120V/AC200-240V
116101307	AGR-31BR-PS DC. DC100-125V/DC200-250V
116101308	AGR-31BR-PS DC24V/48V
116101310	AGR-31BS-PS DC. DC100-125V/DC200-250V
116101324	AGR-31BL-PG DC. DC100-125V/DC200-250V
116101327	AGR-31BR-PG DC. DC100-125V/DC200-250V
116101340	AGR-31BS-PR AC. AC100-120V/AC200-240V
116101341	AGR-31BS-PR DC. DC100-125V/DC200-250V
116101342	AGR-31BS-PR DC24V/48V
116101824	AGR-31BL-PG-C DC. DC100-125V/DC200-250V
NON-AUTOMATIC OPTION	
116141001	NON-AUTOMATIC OCR COVER. 208-440
AGR RELAY OPTIONS	
116152012	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B/AR208-212S/3P
116152002	AGR-Z ZONE Interlock Option. For AGR-22B/31B OCRS
116152003	AGR-N NEUTRAL PHASE PROTECTION. For AGR-11B/21B/31BL/R OCRS
116152004	AGR-I EXTERNAL DISPLAY OPTION. FOR AGR-22B/31B OCRS
116152005	AGR-S PHASE ROTATION PROTCTION. FOR AGR-21B/31B L/R OCRS
116152006	AGR-N NEUTRAL PHASE PROTECTION. FOR AGR-11B/21B/31B L/R OCRS
116152007	AGR-U UNDER Voltage Alarm. FOR AGR-22B/31B OCRS
116152008	AGR-P 2ND PRE-TRIP ALARM PTA2. FOR AGR-22BS-PR/31BS OCRS
116152009	AGR-R RESTRICTED GROUND FAULT. FOR AGR-21/31 BL/R-PG AR2-3P
116152001	AGR-C Communication Option. For AGR-21B/22B/31B OCRS
116152011	AGR-R Restricted Ground Fault. For AGR-21/31BL/R-PG R4-4P

Code	Description
AGR RELAY OPTIONS	
116152013	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B/AR208-212S/4P
116152014	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B/AR216-220SH/3P
116152015	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B/AR216-220SH/4P
116152016	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B OCRS/AR3-3P
116152017	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B OCRS/AR3-4P
116152018	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B OCRS/AR4-3P
116152019	AGR-O CONTACTS TEMP MONITORING. FOR AGR-22B/31B OCRS/AR4-4P
116152010	AGR-R RESTRICTED GROUND FAULT. 21/31BL/R-PG AR2-4P/AR3/AR4-3P
OCR COVER	
116141002	AGR-B TYPE OCR COVER. 208-440
TEMPOWER2 SENSOR KITS	
116102001	SENSOR KIT 3 X 200A. 208
116102002	SENSOR KIT 4 X 200A. 208
116102004	SENSOR KIT 3 X 400A. 208-220
116102005	SENSOR KIT 4 X 400A. 208-220
116102007	SENSOR KIT 3 X 800A. 208-220
116102008	SENSOR KIT 4 X 800A. 208-220
116102010	SENSOR KIT 3 X 1250A. 212-220
116102011	SENSOR KIT 4 X 1250A. 212-220
116102013	SENSOR KIT 3 X 1600A. 216-220
116102014	SENSOR KIT 4 X 1600A. 216-220
116102016	SENSOR KIT 3 X 2000A. 220
116102017	SENSOR KIT 4 X 2000A. 220
116102031	SENSOR KIT 3 X 200A. 325-332
116102032	SENSOR KIT 4 X 200A. 325-332
116102034	SENSOR KIT 3 X 400A. 325-332
116102035	SENSOR KIT 4 X 400A. 325-332
116102037	SENSOR KIT 3 X 800A. 325-332
116102038	SENSOR KIT 4 X 800A. 325-332
116102040	SENSOR KIT 3 X 1000A. 325-332
116102041	SENSOR KIT 4 X 1000A. 325-332
116102043	SENSOR KIT 3 X 1250A. 325-332
116102044	SENSOR KIT 4 X 1250A. 325-332
116102028	SENSOR KIT 3 X 1600A. 325-332
116102029	SENSOR KIT 4 X 1600A. 325-332
116102046	SENSOR KIT 3 X 2000A. 325-332
116102047	SENSOR KIT 4 X 2000A. 325-332
116102019	SENSOR KIT 3 X 2500A. 325-332
116102020	SENSOR KIT 4 X 2500A. 325-332
116102022	SENSOR KIT 3 X 3200A. 332
116102023	SENSOR KIT 4 X 3200A. 332
116102025	SENSOR KIT 3 X 4000A. 440
116102026	SENSOR KIT 4 X 4000A. 440
116102049	SENSOR KIT 3 X 4000A. 440SB
116102050	SENSOR KIT 4 X 4000A. 440SB
116102052	SENSOR KIT 3 X 5000A/3P. 650
116102053	SENSOR KIT 4 X 5000A. 650
116102055	SENSOR KIT 3 X 6300A/3P. 663
116102056	SENSOR KIT 4 X 6300A. 663
116102058	SENSOR KIT 3 X 5000A/4P. 650/4P
116102059	SENSOR KIT 3 X 6300A/4P. 663/4P
TEMPOWER2 ADDITIONAL SENSOR KITS FOR 3 POLE ACBs WITH GROUND FAULT	
116202003	SENSOR KIT 200A N-CT & AUX-CT. 208
116202006	SENSOR KIT 400A N-CT & AUX-CT. 208-220

ACCESSORIES

Code	Description
TEMPOWER2 ADDITIONAL SENSOR KITS FOR 3 POLE ACBs WITH GROUND FAULT	
116202009	SENSOR KIT 800A N-CT & AUX-CT. 208-220
116202012	SENSOR KIT 1250A N-CT & AUX-CT. 212-220
116202015	SENSOR KIT 1600A N-CT & AUX-CT. 216-220
116202018	SENSOR KIT 2000A N-CT & AUX-CT. 220
116202033	SENSOR KIT 200A N-CT & AUX-CT. 325-332
116202036	SENSOR KIT 400A N-CT & AUX-CT. 325-332
116202039	SENSOR KIT 800A N-CT & AUX-CT. 325-332
116202042	SENSOR KIT 1000A N-CT & AUX-CT. 325-332
116202045	SENSOR KIT 1250A N-CT & AUX-CT. 325-332
116202030	SENSOR KIT 1600A N-CT & AUX-CT. 325-332
116202048	SENSOR KIT 2000A N-CT & AUX-CT. 325-332
116202021	SENSOR KIT 2500A N-CT & AUX-CT. 325-332
116202024	SENSOR KIT 3200A N-CT & AUX-CT. 332
116202027	SENSOR KIT 4000A N-CT & AUX-CT. 440
116202051	SENSOR KIT 4000A N-CT & AUX-CT. 440SB
116202054	SENSOR KIT 5000A N-CT & AUX-CT. 650
116202057	SENSOR KIT 6300A N-CT & AUX-CT. 663
TEMPOWER2 TERMINAL BLOCKS - DO ACBs	
116237011	TERMINAL BLOCK/SHT/CHA/B. AGR-B/NON-AUTO WITH SHT ONLY
116237012	TERMINAL BLOCK/UVT/CHA/11B. AGR-B/NON-AUTO WITH UVT ONLY
116237031	TERMINAL BLOCK/SHT/CHASSIS. AGR-22B/31B WITH SHT
116237032	TERMINAL BLOCK/UVT/CHA/31/22B. AGR-31B/22B WITH UVT ONLY
116237611	TERMINAL BLOCK/SHT/CHASSIS/6. NON-AUTO AGR-11B/21B WITH SHT
116237612	TERMINAL BLOCK/UVT/CHASSIS/6. NON-AUTO AGR-11B/21B WITH UVT
116237631	TERMINAL BLOCK/SHT/CHASSIS/6. AGR-22B/31B WITH SHT
116237632	TERMINAL BLOCK/UVT/CHASSIS/6. AGR-22B/31B WITH UVT
TEMPOWER2 TERMINAL BLOCKS - FIXED ACBs	
116337003	ARR-1TB/FS21*UN. FOR AGR21B/SHT/ACB BODY/FX
116337011	TERMINAL BLOCK/SHT/FIX/11B. AGR-11B/NON AUTO WITH SHT ONLY
116337012	TERMINAL BLOCK/UVT/FIX/11B. AGR-11B/NON AUTO WITH UVT ONLY
116337021	TERMINAL BLOCK/SHT/FIX/21B. AGR-21B/22B/31B WITH SHT ONLY
116337022	TERMINAL BLOCK/UVT/FIX/21B. AGR-21B/22B/31B WITH UVT ONLY
116337031	TERMINAL BLOCK/SHT/FIX/31/22B. AGR-31B/22B WITH SHT ONLY
116337032	TERMINAL BLOCK/UVT/FIX/31/22B. AGR-31B/22B WITH UVT ONLY
TEMPOWER2 TERMINAL BLOCKS - FIXED ACBs	
116142001	AGR-11B SW.BASE(WITHOUT MOTOR)
116142101	AGR-21B/SW BASE*UN. WITHOUT MOTOR
TEMPOWER2 MHT COILS	
116131201	MHT UNIT
116131401	SPECIAL SHUNT FOR ACB WITH UVT. SHORT RATED COIL, NEED N/O AUX
TEMPOWER2 MHT COILS	
116418100	MAIN SHUTTER PADLOCK/08-32
116418101	MAIN SHUTTER PADLOCK/40
116418102	MAIN SHUTTER PADLOCK/50-63/3P. 650-663 3P
116418103	MAIN SHUTTER PADLOCK/50-63/4P. 650-663 4P

Code	Description
UNDERVOLTAGE TRIPS	
116205101	AC100-120V UVT INST TRIP CNTRL. UVT CONTROLLER - Chassis Part
116205102	AC100-120V UVT 0.5SEC TD CNTRL. UVT CONTROLLER - Chassis Part
116205103	AC200-240V UVT INST TRIP CNTRL. UVT CONTROLLER - Chassis Part
116205104	AC200-240V UVT 0.5SEC TD CNTRL. UVT CONTROLLER - Chassis Part
116205105	AC380-440V INST TRIP CNTRL. UVT CONTROLLER - Chassis Part
116205106	AC380-440V UVT 0.5SEC TD CNTRL. UVT CONTROLLER - Chassis Part
116205107	DC24V UVT INST TRIP CNTRL. UVT CONTROLLER - Chassis Part
116205108	DC110V UVT INST TRIP CNTRL. UVT CONTROLLER - Chassis Part
116205109	DC48V UVT INST TRIP CNTRL. UVT CONTROLLER - Chassis Part
116105100	UVT COIL ONLY - D/O BODY PART. SPECIFY CONTROLLER TYPE
116305101	AC100-120V UVT INST TRIP. FIX ACB UVT COIL & CONTROLLER
116305102	AC100-120V UVT 0.5SEC TD. FIX ACB UVT COIL & CONTROLLER
116305103	AC200-240V UVT INST TRIP. FIX ACB UVT COIL & CONTROLLER
116305104	AC200-240V UVT 0.5SEC TD. FIX ACB UVT COIL & CONTROLLER
116305105	AC380-440V INST TRIP. FIX ACB UVT COIL & CONTROLLER
116305106	AC380-440V UVT 0.5SEC TD. FIX ACB UVT COIL & CONTROLLER
116305107	DC24V UVT INST TRIP. FIX ACB UVT COIL & CONTROLLER
116305108	DC110V UVT INST TRIP. FIX ACB UVT COIL & CONTROLLER
116305109	DC48V UVT INST TRIP. FIX ACB UVT COIL & CONTROLLER
SHUNT TRIPS	
116106101	DC24V SHUNT. CONTINUOUSLY RATED
116106102	DC48V SHUNT. CONTINUOUSLY RATED
116106103	DC100V SHUNT. CONTINUOUSLY RATED
116106104	DC110V SHUNT. CONTINUOUSLY RATED
116106105	DC125V SHUNT. CONTINUOUSLY RATED
116106106	DC200V SHUNT. CONTINUOUSLY RATED
116106107	DC220V SHUNT. CONTINUOUSLY RATED
116106108	DC250V SHUNT. CONTINUOUSLY RATED
116106109	AC100V SHUNT. CONTINUOUSLY RATED
116106110	AC110V SHUNT. CONTINUOUSLY RATED
116106111	AC120V SHUNT. CONTINUOUSLY RATED
116106112	AC200V SHUNT. CONTINUOUSLY RATED
116106113	AC220V SHUNT. CONTINUOUSLY RATED
116106114	AC240V SHUNT. CONTINUOUSLY RATED
116106201	AC110V CAPACITOR SHUNT. USES DC48V CONT. SHUNT
116106115	DC24V DOUBLE SHUNT. REQUIRES 2A EXTERNAL AUX SW
116106116	DC30V SHUNT. CONTINUOUSLY RATED
116206101	DC24V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206102	DC48V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206103	DC100V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206104	DC110V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206105	DC125V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206106	DC200V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206107	DC220V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206108	DC250V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206109	AC100V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206110	AC110V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206111	AC120V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206112	AC200V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206113	AC220V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
116206114	AC240V SHUNT CONTROLLER. IF ACB HAS UVT & SHUNT FITTED
POSITION SWITCHES - BODY PARTS	
116109001	POSITION SWITCH-BODY PARTS. 208-440
116109002	POSITION SWITCH-BODY PARTS. 650-663
POSITION SWITCHES - CHASSIS PARTS	
116209001	1ISO+1TEST POS SW/S. 08-40 CHASSIS
116209003	1ISO+1CONN POS SW/S. 08-40 CHASSIS
116209005	1TEST+1CONN POS SW/S. 08-40 CHASSIS

ACCESSORIES

Code	Description
POSITION SWITCHES - CHASSIS PARTS	
116209007	2ISO POS SW/S. 08-40 CHASSIS
116209009	2TEST POS SW/S. 08-40 CHASSIS
116209011	2CONN POS SW/S. 08-40 CHASSIS
116209013	1INS+1ISO+1TEST+1CONN POS SW/S. 08-40 CHASSIS
116209015	1INS+2ISO+1TEST POS SW/S. 08-40 CHASSIS
116209017	1INS+2ISO+1CONN POS SW/S. 08-40 CHASSIS
116209019	2ISO+1TEST+1CONN POS SW/S. 08-40 CHASSIS
116209021	1INS+1ISO+2TEST POS SW/S. 08-40 CHASSIS
116209023	1INS+2TEST+1CONN POS SW/S. 08-40 CHASSIS
116209025	1ISO+2TEST+1CONN POS SW/S. 08-40 CHASSIS
116209027	1INS+1ISO+2CONN POS SW/S. 08-40 CHASSIS
116209029	1INS+1TEST+2CONN POS SW/S. 08-40 CHASSIS
116209031	1ISO+1TEST+2CONN POS SW/S. 08-40 CHASSIS
116209033	2ISO+2TEST POS SW/S. 08-40 CHASSIS
116209035	2ISO+2CONN POS SW/S. 08-40 CHASSIS
116209037	2TEST+2CONN POS SW/S. 08-40 CHASSIS
116209039	1INS+3TEST POS SW/S. 08-40 CHASSIS
116209041	1ISO+3TEST POS SW/S. 08-40 CHASSIS
116209043	3TEST+1CONN POS SW/S. 08-40 CHASSIS
116209045	1INS+3CONN POS SW/S. 08-40 CHASSIS
116209047	1ISO+3CONN POS SW/S. 08-40 CHASSIS
116209049	1TEST+3CONN POS SW/S. 08-40 CHASSIS
116209051	4TEST POS SW/S. 08-40 CHASSIS
116209053	4CONN POS SW/S. 08-40 CHASSIS
AUXILIARY SWITCHES	
116207001	4AB STD D/O AUX SW/S
116207003	7AB STD D/O AUX SW/S
116207005	10AB STD D/O AUX SW/S
116207007	4AB STD+3AB GLD D/O AUX SW/S
11620700	7AB STD+3AB GLD D/O AUX SW/S
116207020	4AB STD D/O AUX-M SW/S. FOR MARINE/MECH.I/LOCK
116207022	7AB STD D/O AUX-M SW/S. FOR MARINE/MECH.I/LOCK
116207024	10AB STD D/O AUX-M SW/S. FOR MARINE/MECH.I/LOCK
116207026	4AB STD+3AB GLD D/O AUX-M SW/S. FOR MARINE/MECH.I/LOCK
116207028	7AB STD+3AB GLD D/O AUX-M SW/S. FOR MARINE/MECH.I/LOCK
116307001	4AB STD FIX AUX SW/S
116307003	7AB STD FIX AUX SW/S
116307005	10AB STD FIX AUX SW/S
116307007	4AB STD+3AB GLD FIX AUX SW/S
116307009	7AB STD+3AB GLD FIX AUX SW/S
TRIP INDICATION SWITCH	
116121001	TRIP IND. SW-STD TYPE - D/O. NOT READY TO CLOSE INDICATION
116121002	TRIP IND. SW-GLD TYPE - D/O. NOT READY TO CLOSE INDICATION
116321001	TRIP IND. SW-STD TYPE - FIX. NOT READY TO CLOSE INDICATION
116321002	TRIP IND. SW-GLD TYPE - FIX. NOT READY TO CLOSE INDICATION
CHARGE UP SWITCH	
116140101	CHARGE UP SW-STD TYPE - D/O
116140102	CHARGE UP SW-GLD TYPE - D/O
116340101	CHARGE UP SW-STD TYPE - FIX
116340102	CHARGE UP SW-GLD TYPE - FIX
OPEN CLOSE COUNTER	
116112001	CLOSE-OPEN CYCLE COUNTER
CHARGE UP SWITCH	
116128001	AUTO-DISCHARGE DEVICE. 208-220S BODY
116128002	AUTO-DISCHARGE DEVICE. 208-220H BODY
116128003	AUTO-DISCHARGE DEVICE. 325-332/3P BODY

Code	Description
AUTO DISCHARGE DEVICE - BODY PARTS	
116128004	AUTO-DISCHARGE DEVICE. 325-332/4P BODY
116128005	AUTO-DISCHARGE DEVICE. 440 BODY
116128007	AUTO-DISCHARGE DEVICE. 650-663 BODY
AUTO DISCHARGE DEVICE - CHASSIS PARTS	
116228001	AUTO-DISCHARGE DEVICE. 208-220 3P CHASSIS
116228002	AUTO-DISCHARGE DEVICE. 208-220 4P CHASSIS
116228003	AUTO-DISCHARGE DEVICE. 325-332 3P CHASSIS
116228004	AUTO-DISCHARGE DEVICE. 325-332 4P CHASSIS
116228005	AUTO-DISCHARGE DEVICE. 440 3P CHASSIS
116228006	AUTO-DISCHARGE DEVICE. 440 4P CHASSIS
116228007	AUTO-DISCHARGE DEVICE. 650-663 CHASSIS
HEAT SENSORS	
116135001	HEAT SENSOR 3P 208-220
116135002	HEAT SENSOR 4P 208-220
116135003	HEAT SENSOR 3P 325-332
116135004	HEAT SENSOR 4P 325-332
116135005	HEAT SENSOR 3P 440
116135006	HEAT SENSOR 4P 440
MAL INSERTION DEVICE - BODY PARTS	
116113001	INSERTION PREVENTION DEVICE. Body Unit
116113002	INSERTION PREVENTION DEVICE. 650-663 Body Unit
MAL INSERTION DEVICE - CHASSIS PARTS	
116213001	INSERTION PREVENTION DEVICE. Chassis Unit
116213002	INSERTION PREVENTION DEVICE. 650-663 Chassis Unit
READY TO CLOSE SWITCHES	
116121003	VOLTFREE READY TO CLOSE SW-D/O. IF SPRING CHARGE SW IS NEEDED
116121004	VOLTFREE READY TO CLOSE SW-D/O. IF SPRING CHARGE SW IS NEEDED
116321004	VOLTFREE READY TO CLOSE SW-FIX. IF SPRING CHARGE SW IS NEEDED
116321003	VOLTFREE READY TO CLOSE SW-FIX. IF SPRING CHARGE SW IS NEEDED
TERMINAL COVERS	
116219001	TERMINAL COVER/S/3P. 208-220
116219003	TERMINAL COVER/S/4P. 208-220
116219005	TERMINAL COVER/S/3P. 325-332
116219007	TERMINAL COVER/S/4P. 325-332
116219009	TERMINAL COVER/S/3P/4P. 440
116219013	TERMINAL COVER/FULL/S/3P. 650-663 Aux/Pos/Control
116219015	TERMINAL COVER/FULL/S/4P. 650-663 Aux/Pos/Control
TEMPOWER2 INTERPOLE BARRIERS	
116229001	I'POLE BARRIER 3P DO 208-220. NOT FOR FC
116229002	I'POLE BARRIER 4P DO 208-220. NOT FOR FC
116229003	I'POLE BARRIER 3P DO 325-332. NOT FOR FC
116229004	I'POLE BARRIER 4P DO 325-332. NOT FOR FC
116229005	I'POLE BARRIER 3P DO 440. NOT FOR FC
116229006	I'POLE BARRIER 4P DO 440. NOT FOR FC
116229007	I'POLE BARRIER 650-663/3P/DO
116229008	I'POLE BARRIER 650-663/4P/DO
IP COVERS	
116414001	IP55 TRANSPARENT COVER. 208-440
DOOR FLANGE	
116425001	IP20 DOOR FLANGE
116425002	IP31 DOOR FLANGE
DOOR FLANGE DRILLING TEMPLATE	
116425003	DOOR FLANGE DRILLING TEMPLATE
DRAWOUT HANDLES	
116423001	STANDARD DRAW-OUT HANDLE
116423002	STORAGE DRAW-OUT HANDLE
116423003	SHORT STORAGE HANDLE

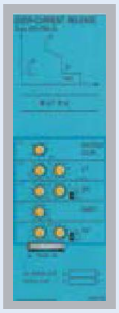
ACCESSORIES

Code	Description
TEST JUMPER	
116432001	TEST JUMPER- 5 METERS
AUTO DISCHARGE DEVICE - CHASSIS PARTS	
116239001	1 OFF ARC BARRIER/203HV. 208-220 3P CHASSIS
116239003	1 OFF ARC BARRIER/204HV. 208-220 4P CHASSIS
116239005	1 OFF ARC BARRIER/203FC. 208-220 3P CHASSIS
116239007	1 OFF ARC BARRIER/204FC. 208-220 4P CHASSIS
116239009	1 OFF ARC BARRIER/323HV. 325-332 3P CHASSIS
116239011	1 OFF ARC BARRIER/324HV. 325-332 4P CHASSIS
116239013	1 OFF ARC BARRIER/323FC. 325-332 3P CHASSIS
116239015	1 OFF ARC BARRIER/324FC. 325-332 4P CHASSIS
116239017	1 OFF ARC BARRIER/403VC. 440 3P CHASSIS
116239019	1 OFF ARC BARRIER/404VC. 440 4P CHASSIS
IP3X PROTECTION	
116225002	IP3X CHASSIS PROTECTION. 208-220 3P
116225003	IP3X CHASSIS PROTECTION. 208-220 4P

Code	Description
IP3X CHASSIS PROTECTION	
116225004	IP3X CHASSIS PROTECTION. 325-332 3P
116225005	IP3X CHASSIS PROTECTION. 325-332 4P
116225006	IP3X CHASSIS PROTECTION. 440 3P
116225007	IP3X CHASSIS PROTECTION. 440 4P
LIFT PLATES	
116415001	LIFTING PLATES-D/O
116415002	LIFTING PLATES-D/O6500-663
OCR CHECKER	
116430002	AC110/240V ANU-1 OCR CHECKER. 208-440
TROPICALISATION	
116349001	TROPICALIZATION/FX ACB
116349002	ANTI-CORROSION/FX ACB
116149001	TROPICALIZATION/DO ACB BODY
116149002	ANTI-CORROSION/DO ACB BODY
116249001	TROPICALIZATION/ACB CHASSIS
116249002	ANTI-CORROSION/ACB CHASSIS

TEMPPOWER2

TemPower2



Standard OCR with adjustable dial
Type: **AGR-11B**

Standard OCR with LCD-'Ammeter' adjustable dial
Type: **AGR-121B,22B**
Backlit LCD optional

Enhanced OCR with LCD-'Analyser'
Type: **AGR-31B**
Backlit LCD installed

Overload Protection

Adjustable from 40-100% of rated current. True r.m.s detection up to the 19th harmonic, a distant vision for the competition who rarely see past the 7th. Neutral protection for all those Triple-N harmonics, such as 3rd, 9th and 15th. Also in case we forgot to mention, a "thermal memory" is available on the **AGR21B/31B.**

Reverse Power Trip Function

(S-characteristic) This feature provides additional protection when paralleling generators. The **AGR22B/31** OCR for generator protection with the reverse power trip function, negates the need for installation and wiring in an external reverse power relay. This feature is available using an AGR OCR with a generator "S" type characteristic only.

Two Channel Pre-Trip Alarm Function (optional)

This function can be used to monitor and switch on additional power backup to feedcritical circuits. For example, the function can be set so that when a pre-trip alarm is activated, an emergency generator starts to ensure a constant supply. This feature is only available on some **AGR22B/31B** OCR models with a generator "S" characteristic.

N-phase Protection Function (optional)

In 3-phase, 4-wire systems that contain harmonic distortion, the 3rd harmonic may cause large currents to flow through the neutral conductor from sustaining damage or burnout due to these large currents. Available in all OCR's except for generator "S" characteristic types.

Ground Fault Trip Function

This function eliminates external relays to provide a ground fault protection to TN-C or TN-S power distribution systems on the load side. Ground fault protection on the side is also available as an option.

Earth Leakage Trip Function

Used in conjunction with Zero phase Current Transformer (ZCT), this function provides protection against leakage to earth of very small levels of current. Trip Alarm indication, and contact is available to enhance the level of system protection

Phase Rotation Protection Function

This function detects the negative-phase current occuring due to reverse phase or phase loss and prevents burnout of a motor or damage to equipment

Advanced L.C.D Display, Over Current Relay

The **AGR-31B** OCR comes standard with the backlit LCD display. It can monitor and indicate phase currents, voltages, power, energy, power factor, frequency, and more. The backlit LCD is optional for **AGR-21B** and **AGR-22B.**

Remote Communication Protocals (optional)

Data communications via Modbus, an open network, are supported. **Energy Management -** I, V, kW, kVar, cosØ, frequency
Intelligent Fault Analysis - Status, fault type, fault size, tripping time, fault history
Maintenance Information - Trip circuit supervision, contact temperature monitoring.

Contact Temperature Monitoring Function (optional)

This function monitors the temperature of the ACB's main contacts. An alarm indicates when the temperature exceeds 155°. Continuous monitoring of the contact temperature provides valuable input for preventative and predictive maintenance programs.

OCR SPECIFICATIONS

Protection Characteristics		Protection Relay	Protection							Functions			
			Standard				Ground Fault		N-Phase	Indication & Monitoring			
			Long	Short	Instantaneous		Un-Restricted	Restricted	N-Phase	Contact Indication		Monitoring	
			LT	ST	INST	MCR	UREF	REF ②	NP	Single	Individual	Ammeter	Energy Analyser
Standard Protection Relays													
Dial Type	For General Feeder Circuits	AGR-11BL-AL	●	●	-	-	-	○	●	-	-	-	-
Dial Type	For General Feeder Circuits	AGR-11BL-GL	●	●	-	●	-	○	●	-	-	-	-
Standard LCD Type	For General Feeder Circuits	AGR-21BL-PS	●	●	●	-	-	○	-	●	●	-	-
Standard LCD Type	For General Feeder Circuits	AGR-21BL-PG	●	●	●	●	○	○	-	●	●	-	-
SpecialisedProtection Relays													
Standard LCD Type	IEC 60255-3	AGR-21BR-PS	●	●	●	-	-	○	-	●	●	-	-
Standard LCD Type	IEC 60255-3	AGR-21BR-PG	●	●	●	●	○	○	-	●	●	-	-
Standard LCD Type	For Generator Protection	AGR-21BR-PS	●	●	●	-	-	-	-	●	●	-	-
Standard LCD Type	For Generator Protection	AGR-21BR-PR	●	●	●	-	-	-	-	●	●	-	○
Enhanced LCD Type	For General Feeder Circuits	AGR-31BL-PS	●	●	●	-	-	○	-	●	-	●	○
Enhanced LCD Type	For General Feeder Circuits	AGR-31BL-PG	●	●	●	●	●	○	-	●	-	●	○
Enhanced LCD Type	IEC 60255-3	AGR-31BR-PS	●	●	●	-	-	○	-	●	-	●	○
Enhanced LCD Type	IEC 60255-3	AGR-31BR-PG	●	●	●	●	●	○	-	●	-	●	○
Enhanced LCD Type	For Generator Protection	AGR-31BS-PS	●	●	●	-	-	-	-	●	-	●	○
Enhanced LCD Type	For Generator Protection	AGR-31BS-PR	●	●	●	-	-	-	-	●	-	●	○

KEY :

● : Available as standard

○ : Available as option

— : Not available

① : Standard Inverse, Very Inverse, Extremely Inverse Curves.

② : Only one function can be selected from OH, NS, REF or trip Indication. Selection of two or more functions involves manual connection of their control circuits (special specification). Contact Terasaki for details.

③ : Only one function can be selected from PTA2, UV or spring charge indication. Selection of two or more functions involves manual connection of their control circuits (special specifications). Contact Terasaki for details.

④ : Not available if CT rated primary current [I_{CT}] is 200A or less.

⑤ : Available up to 3,200A rated current [I_n].

⑥ : Over AC 250V, a step down VT is required.

Note: When a protection function of ARG-11B OCRs with single contact indication is activated, the corresponding operation LED indicator is ON momentarily or OFF. But the LED indicator is kept ON when the protection function is checked with the optional OCR checker.

OCR SPECIFICATIONS

Special Applications												
Contact Temp. Monitoring	Zone Interlock	Earth Leakage Protection	Reverse Power Protection	Phase Rotation Protection	Under Voltage Alarm	Pre-Trip Alarm		Spring Charge Indication	Trip Indication	Communi-cation	Field Test	Control Test
OH ②	Z	ELT ⑤	RPT ⑥	NS ②	UVA ③	PTA	PTA ③	③	②	C		
[redacted]												
-	-	-	-	-	-	-	-	○	○	-	-	Not Required
-	-	-	-	-	-	-	-	○	○	-	-	Not Required
-	-	-	-	○	-	●	-	○	○	○	●	Required
-	-	-	-	○	-	●	-	○	○	○	●	Required
[redacted]												
-	-	-	-	○	-	●	-	○	○	○	●	Required
-	-	-	-	○	-	●	-	○	○	○	●	Required
-	-	-	-	-	-	●	-	○	○	○	●	Required
○	○	-	●	-	○	●	○	○	○	○	●	Required
○	○	○	-	○	○	●	-	○	○	○	●	Required
○	○	-	-	○	○	●	-	○	○	○	●	Required
○	○	○	-	○	○	●	-	○	○	○	●	Required
○	○	-	-	○	○	●	-	○	○	○	●	Required
○	○	-	-	-	○	●	○	○	○	○	●	Required
○	○	-	●	-	○	●	○	○	○	○	●	Required

If the control power is not supplied or is lost, each function operates as follows:

LT,ST, INST, RPT: Operates Normally
GF: Operates Normally
When the CY rated primary current [I_{CT}] is less than 800A and the GF pick-up current is set to 10%, the GF becomes inoperative.

MCR: Operates as inst.
PTA - 1 Channel: Is inoperative
PTA - 2 Channel: Is inoperative
ELT: Is inoperative
LCD: Will display without backlit
Field Test Facility: Is inoperative

LED Indicator on OCRs - single contact indication: Is on momentarily
Contact output from OCRs - single contact indication: Turns off after 40ms or more
Contact output from OCRs - individual contact indication: Is inoperative

APPLICATION DATA

Discrimination Tables

Upstream ACB

Upstream: TemPower 2 ACB with or without integral Protection Relay. Downstream: TemBreak 2 MCCB.

Downstream MCCB																		
Frame			800A		1250A		1600A		2000A		2500A		3200A		4000A	5000A	6300A
	Model		AR208S	AR208H	AR212S	AR212H	AR216S	AR216H	AR220S	AR220H	AR325S	AR325H	AR332S	AR332H	AR440S	AH50C	AH60C
		Breaking Capacity	65kA	80kA	65kA	80kA	65kA	80kA	65kA	80kA	85kA	100kA	85kA	100kA	100kA	100kA	120kA
125A	E125NJ	25kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S125NJ	36kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S125GJ	65kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H125NJ	125kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	L125NJ	200kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
160A/ 250A	S160NJ	36kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S160GJ	65kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	N250NJ	25kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S250NJ	36kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S250GJ	65kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S250NE	50kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S250GE	65kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S250PE	70kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H250NJ	125kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	L250NJ	200kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
430A/ 630A	E400NJ	25kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S400CJ	36kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S400NJ	50kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S400NE	50kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S400GJ	70kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S400GE	70kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H400NJ	125kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H400NE	125kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	E630NE	36kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S630CE	50kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S630GE	70kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
800A	XS800NJ	65kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	XH800SE	65kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	XH800PJ	100kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	XS800SE	50kA	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
1250A/ 1600A	XS1250SE	65kA	–	–	T	T	T	T	T	T	T	T	T	T	T	T	T
	XS1600SE	85kA	–	–	–	–	T	T	T	T	T	T	T	T	T	T	T

Type 2 Coordination for Motor Starters: For details of Type 2 Coordination for motor starters, please contact our Sales or Product Manager, or technical support team.
Type Tested Assemblies: For details of certified Type-Tested Assemblies using Terasaki ACBs and MCCBs, please contact our Product Manager, or technical support team.

Maximum Configurations for Installation of TemBreak2 Accessories

Accessory	MCCB 125A	MCCB 160A - 250A 2	MCCB 400A - 630A 3	MCCB 800 - 1600A
General purpose Auxiliary Switch	2	2	1	3
General purpose Alarm Switch	1	1	1	1
Shunt Trip or UVT	1	1	0	1
Shunt +	0	0	0	0
Auxillery	0	0	0	0
OR				
Accessory	**MCCB 125A**	**MCCB 160A - 250A**	**MCCB 400A - 630A**	
Heavy Duty Auxiliary Switch	2	2	3	
Heavy Duty Alarm Switch	1	1	1	
Shunt Trip or UVT	1	1	1	

APPLICATION DATA

Downstream MCCB														UPstream MCCB
Frame		25A	40A	63A	80A	100A	125A	160A	100A	125A	160A	200A	250A	
	Model	S160-SCJ (25kA), S160-SJ (40kA)							E250-SJ (25kA), S250-SJ (40kA)					
6A		1000	1000	3000	3000	5000	5000	6000	10000	10000	10000	10000	10000	
10A		1000	1000	2000	2000	4000	4000	5000	10000	10000	10000	10000	10000	
16A		600	600	2000	2000	3000	3000	4000	10000	10000	10000	10000	10000	
20A		600	600	2000	2000	3000	3000	3000	10000	10000	10000	10000	10000	
25A			600	1500	1500	2500	2500	3000	10000	10000	10000	10000	10000	
32A			600	1500	1500	2500	2500	3000	9000	10000	10000	10000	10000	
40A				1500	1500	2500	2500	3000	8000	9000	10000	10000	10000	
50A				1500	1500	2500	2500	3000	7000	8000	9000	10000	10000	
63					1500	2500	2500	3000	6000	7000	8000	9000	10000	

APPLICATION DATA

Cascading Tables

Upstream: TemBreak 2 MCCB
Downstream: TemBreak 2 MCCB.

Upstream MCCB

Downstream MCCB																				
Frame			125A					160A/250A												
	Model		E125NJ	S125NJ	S125GJ	H125NJ	L125NJ	S160NJ	S160GJ	H160NJ	L160NJ	E250NJ	S250NJ	S250GJ	S250NE	S250GE	S250PE	H250NJ H250NE	L250NJ
		Breaking Capacity	25kA	36kA	65kA	125kA	200kA	36kA	65kA	125kA	200kA	25kA	36kA	65kA	50kA	65kA	70kA	125kA	200kA
50A	S50NF	10kA	25	25	25	25	25	15	15	25	25	15	15	15	15	15	15	25	25
	E100NF	10kA	25	25	25	25	25	15	15	25	25	15	15	15	15	15	15	25	25
125A	E125NJ	25kA	–	36	50	65	85	36	50	65	85	–	36	50	50	50	50	65	85
	S125NJ	36kA	–	–	65	85	125	–	65	85	125	–	–	65	50	65	65	85	125
	S125GJ	65kA	–	–	–	125	150	–	–	125	150	–	–	–	50	70	70	125	150
	H125NJ	125kA	–	–	–	–	200	–	–	–	200	–	–	–	–	–	–	200	–
160A/ 250A	S160NJ	36kA	–	–	–	–	–	–	65	85	125	–	–	65	50	65	65	85	125
	S160GJ	65kA	–	–	–	–	–	–	–	125	150	–	–	–	50	65	70	125	150
	H160NJ	125kA	–	–	–	–	–	–	–	–	200	–	–	–	–	–	–	–	200
	E250NJ	25kA	–	–	–	–	–	–	–	–	–	–	36	50	50	65	50	65	85
	S250NJ	36kA	–	–	–	–	–	–	–	–	–	–	–	65	50	65	65	85	125
	S250GJ	65kA	–	–	–	–	–	–	–	–	–	–	–	–	50	65	70	125	150
	S250NE	50kA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	125	150
	S250GE	65kA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	125	150
	S250PE	70kA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	125	150
	H250NJ	125kA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	200

Notes:
1. All values shown at 400V AC.
2. Cascade fault level limit is expressed in kA.

Upstream MCCB

Downstream MCCB																	
Frame			400A					630A				800A					
	Model		S400CJ	S400NJ S400NE	S400GJ S400GE	H400NJ H400NE	L400NJ L400NE	E630NE	S630CE	S630GE	TL630NE	XS800SE	XS800NJ	XH800SE	TL800NE	XS1250SE	XS1600SE
		Breaking Capacity	36kA	50kA	70kA	125kA	200kA	36kA	50kA	70kA	125kA	50kA	65kA	65kA	125kA	85kA	100kA
125A	E125NJ	25kA	36	36	50	65	85	36	36	50	–	36	36	36	–	–	–
	S125NJ	36kA	–	50	65	85	125	–	50	65	–	50	50	50	–	–	–
	S125GJ	65kA	–	–	70	125	150	–	–	70	–	–	–	–	–	–	–
	H125NJ	125kA	–	–	–	–	200	–	–	–	–	–	–	–	–	–	–
160A/ 250A	S160NJ	36kA	–	50	65	85	125	–	50	65	–	50	65	65	65	–	–
	S160GJ	65kA	–	–	70	125	150	–	–	70	–	–	–	–	–	–	–
	H160NJ	125kA	–	–	–	–	200	–	–	–	–	–	–	–	–	–	–
	E250NJ	25kA	36	36	50	65	85	36	36	50	–	36	50	50	50	–	–
	S250NJ	36kA	–	50	65	85	125	–	50	65	–	50	65	65	65	–	–
	S250GJ	65kA	–	–	70	125	150	–	–	70	–	–	–	–	–	–	–
	S250NE	50kA	–	–	–	125	150	–	–	–	–	–	–	–	–	–	–
	S250GE	65kA	–	–	–	125	150	–	–	–	–	–	–	–	–	–	–
	S250PE	70kA	–	–	–	125	150	–	–	–	–	–	–	–	–	–	–
	H250NJ	125kA	–	–	–	–	200	–	–	–	–	–	–	–	–	–	–
400A	E400NJ	25kA	36	36	50	65	85	36	36	50	36	36	50	50	636	36	36
	S400CJ	36kA	–	50	65	70	100	–	50	65	50	50	65	65	50	50	50
	S400NJ	50kA	–	–	70	85	125	–	–	70	65	–	–	65	65	65	65
	S400GJ	75kA	–	–	–	125	150	–	–	–	–	–	–	–		–	85
	H400NJ	125kA	–	–	–	–	200	–	–	–	–	–	–	–		–	–

Notes:
1. All values shown at 400V AC.
2. Cascade fault level limit is expressed in kA.

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次代に応える技術価値、企業価値の創造を

当社は1923年の創業以来、電気エネルギー制御技術をベースにした配電制御システム、ブレーカ、電子デバイスの製造に努め、船舶、建築、産業部門に貢献してきました。日本の産業構造の大きな変容、技術の世界標準志向や市場のグローバル化など激動の時代にあって、真に価値ある企業活動を推進することは容易ではありません。そんな中、当社は長年に渡り蓄積されたノウハウと実績を基盤に変革と刷新の志をもって、3事業分野におけるリーディングカンパニーとして邁進していきたいと考えます。産業と、環境と、暮らしの明日をみつめ、テラサキは進化し続けます。

Creating technical values and corporate values for the next generation……

Since our founding in 1923, TERASAKI has manufactured electric distribution and motor control systems, circuit breakers and electronic devices based on electrical energy control technologies and through our pursuit of excellence made solid contributions to the shipbuilding, construction and manufacturing industries. Yet in the turbulent times of great transformation in Japan's industrial structures, technology's path towards worldwide standardization and globalization, it is not an easy task to promote corporate activities of true value. Amidst the situation, we stand strong on our know-how and performance records accumulated over the many years and are marching forward with a will for innovations and restructuring to be a leading company in these three business fields. TERASAKI will continue to strive towards excellence with considerations on outlook on the future of industry, the environment and lifestyles.

TECS

MARINE

INDUSTRIAL

COMMERCIAL

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TECS

DIN MODULAR DEVICES

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- Rccb

Our Sales Network 12

MCB
TECHNICAL DESCRIPTION

For use in commercial and industrial electrical distribution systems
Protects against overloads and short circuits, switching and isolation.

TRIP CHARACTERISTICS

TYPE "B" CHARACTERISTICS

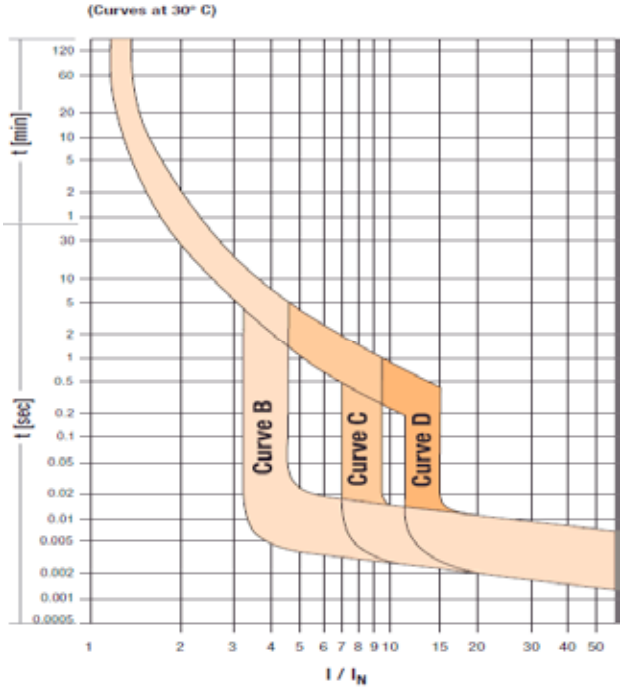
Developed primarily to protect conductors and low level signal devices such as PLCs. Instantaneous trip is three to five times the rated current of the Supplementary Protector (3~5 x In). The fast trip time of these devices minimizes damage to control circuit conductors from low-level faults.

TYPE "C" CHARACTERISTICS

Developed primarily for applications with moderate inrush currents such as lighting, control circuits and appliances. Instantaneous trip is five to ten times the rated current of the Supple¬mentary Protector (5~10 x In). The higher instantaneous trip level prevents nuisance tripping, and components being protected can typically withstand higher fault currents without being damaged.

TYPE "D" CHARACTERISTICS

Developed primarily for applications with high inrush currents, i.e., transformers, and motors. Instantaneous trip is ten to twenty times the rated cur¬rent of the Supplementary Protector (10~20 x In). The high instantaneous trip level prevents nuisance tripping, and components being protected can typically withstand higher fault currents without being damaged.



DC CIRCUITS USE

Thermal Characteristics for TECS breakers are unaffected by the current applied, that is either direct current or alternatiting current. The magnetic trip current value increases by 40%. Eg. In the case; a breaker of tripping characteristic B and 10A rated current, its magnetic tripping value will be between 30A and 50A in alternating current. The magetic tripping value for this very same breaker in direct current will be between 42.4A and 70.7A .

For DC service, the MCBs full rated breaking capacity can be achieved without any reduction in performance by connecting protected poles in series. For values up to 48V=, 1 protected pole can be used unimpaired of the breaking capacity value. Between 48 and 100V=, 2 protected poles series connected can be used without reduction in the breaking capacity. Between 110 and 150V=, 3 protected poles series connected must be used, and 4 poles up to 200V=. Connected must be used, and 4 poles up to 200V=.

TERASAKI
Innovators in Protection Technology

TECS MCB

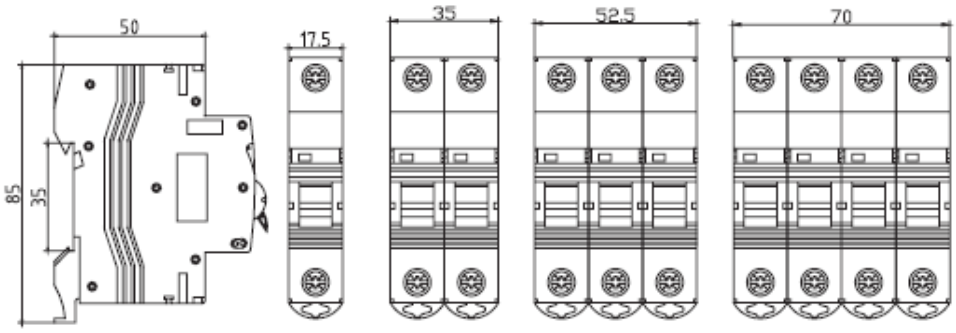
EP SERIES

SPECIFICATION

SPECIFICATIONS

Rated Capacity	Phase to Neutral 230V/240V~ / Phase to Phase 400V/415V~
Rigid Conductor	25mm² Maximum
Flexible Conductor	16mm² Maximum
Characteristics	B CURVE / C CURVE / D CURVE
Capacity	6 kA / 10kA
Standards	EN 60898 / EN 60947-2 / KEMA / SEMCO / SNI / CE / ROHS
Frequency	50/60Hz
Calibration Temperature	30˚C
Electrical Endurance	8000
Mechanical Endurance	20000

DIMENSIONS



TECS RCCB
TECHNICAL DESCRIPTION

Providing protection against overload and short-circuit currents and protects people against earth fault currents: direct or indirect contact, fire…….

TRIP CHARACTERISTICS

The RCD employs the current balance principle which involves the supply conductors to the load (phase and neutral) wound onto a common transformer core to form the primary windings. Under healthy conditions, the current in the phase conductor is equal to the current in the neutral and the vector sum of the current is zero.

In the event of an earth fault, an amount of current will flow to earth, creating an out of balance situation in the transformer assembly. This out of balance detected by the secondary winding of the transformer will activate the trip mechanism at a pre-determined level. Single phase and neutral or three phases and neutral units (suitable for both 3 wire and 4 wire systems) are available, the latter being suitable for balanced or unbalanced 3 phase loads.

The RCD tripping mechanism will operate at a residual current of between 50%-100% of its rated tripping current. (Sensitivity)

RESIDUAL TRIPPING CURRENTS

10mA	Suitable for use in special applications where additional protection against contact is essential
30mA	Tripping current to provide additional protection against direct contact shock
100mA	Suitable for use against direct contact shock or where protection is guard against fire hazards etc.
300mA	Suitable for use in large installations where equipment protection are main considerations and high levels of earth leakage are experienced.

FAULT CURRENT SENSITIVITY

Semi-conductor devices are extensively integrated in equipments in industries, commerce and in our homes.
They can be found in control panels to computers to toys.

As equipments are fed from the mains electrical supply; in the event of an earth fault, the presence of semi-conductors may result in the normal AC waveform being replaced by a non-sinusoidal fault current. In some cases, the waveform may be rectified. These waveforms are said to contain a pulsating DC component which can either partially desensitize a standard type AC RCD.

International standards IEC 1008 (RCCBs) and IEC 1009 (RCBOs) divide RCDs into two performance classes:

Type AC
RCDs for which tripping is ensured for residual sinusoidal alternating currents; whether suddenly applied or slowly arising.

Type A
RCDs for which tripping is ensured for residual sinusoidal alternating currents and residual pulsating direct currents, whether suddenly applied or slowly arising.

TERASAKI
Innovators in Protection Technology

EPR SERIES

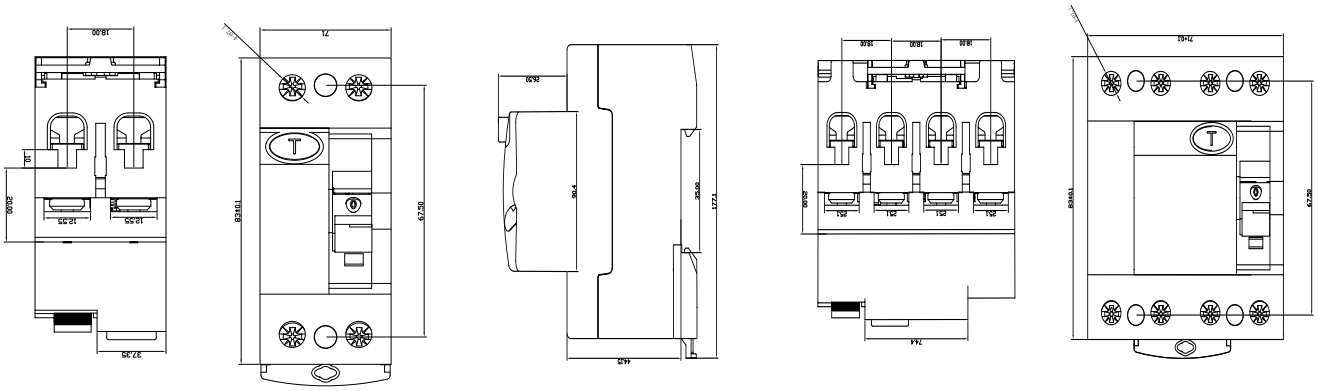
TECS RCCB

SPECIFICATION

SPECIFICATIONS

Rated Capacity	25 A, 32 A, 40 A, 63 A, 80 A, 100 A
Rigid / Flexible Conductor	35mm² / 25mm² MAXIMUM
Calibration Temperature	30˚C
Frequency	50/60Hz
Electrical Endurance	10000
Mechanical Endurance	20000
Standards	EN 61008-1 / EN 61008-2-1 / ROHS / CE
Poles	2P and 4P; Ue: 230 Vac (2P), 230/400 Vac (4P); 50/60 Hz;
IΔn	30 mA, 100 mA, 300 mA, type A and AC;
Inc = IΔc	6 kA; Im = IΔm: 10 In or 500 A whichever is the greater;

DIMENSIONS



TECS RCBO

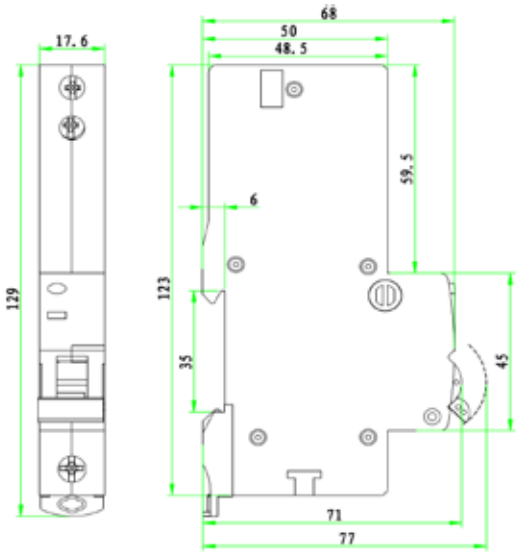
EPR SERIES

SPECIFICATION

SPECIFICATIONS

Rated Current (In)	6, 10, 15, 16, 20, 25, 32, 40A
Rated Voltage (Un)	230VAC
Breaking Capacity	6KA
Rated Tripping Current	30mA, 100mA, 300mA
Characteristics	B, C CURVE
Number of Poles	1P+N
Type of Terminal	LUG TYPE
Terminal Capacity	25mm² Maximum
Width	17.6mm / Module
Standards	IEC61009, EN6009

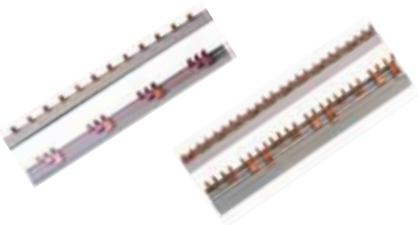
DIMENSIONS



ACCESSORY

COMPLEMENTING OUR DIN MODULAR DEVICE RANGE

INSULATED PIN TYPE BUSBAR / INSULATED FORK TYPE BUS BAR



Current carrying capacity

		1 pole				2, 3, 4 poles	
Feed-in from the end cross section mm²		10	12	16	20	10	16
max. current I_s/phase (A)	$I_E = I_S$	63	65	80	90	63	80
Feed-in from the middle max. current I_s/phase (A)	n 3 2 1 1 2 3 n; $I_E = \Sigma I_S$	100	110	130	150	100	130
max. feed-in current I_E/phase		Depends on the cross section for connection					

If you feed-in from the middle you have to observe that the sum of the outgoings in not higher than the max. current of the busbars Is/phase.

SHUNT TRIP / UNDER VOLTAGE TRIP / AUXILLARY CONTACTS

SHUNT TRIP RATINGS
- Shunt trip 12-48VAC / VDC
- Shunt trip 110-415VAC and 110-125VDC

UNDER VOLTAGE TRIP RATINGS
- UVT 12-48VAC / VDC
- UVT 110-415VAC and 110-125VDC

AUXILLARY CONTACT RATINGS
- AUX 1C / 2C
- UVT 110-415VAC and 110-125VDC

LOAD CENTRE

Our load centre has been designed to take incoming supplies of 125A, 160A and 250A, with outgoing terminals at 18 mm or 25 mm centres and 27 mm.

ORDERS CODES

E P	C	1 0	1 0	1

EP SERIES				
CURVE TYPE	B	C	D	
BREAKING CAPACITY	06	10		
AMPERE RATING				
NUMBER OF POLES	1	2	3	4

MCB ORDER CODES

		6kA			10kA		
		B Curve	C Curve	D Curve	B Curve	C Curve	D Curve
1 POLE	2	EPB 06021	EPC 06021	EPD 06021	EPB 10021	EPC 10021	EPD 10021
	4	EPB 06041	EPC 06041	EPD 06041	EPB 10041	EPC 10041	EPD 10041
	6	EPB 06061	EPC 06061	EPD 06061	EPB 10061	EPC 10061	EPD 10061
	10	EPB 06101	EPC 06101	EPD 06101	EPB 10101	EPC 10101	EPD 10101
	16	EPB 06161	EPC 06161	EPD 06161	EPB 10161	EPC 10161	EPD 10161
	20	EPB 06201	EPC 06201	EPD 06201	EPB 10201	EPC 10201	EPD 10201
	25	EPB 06251	EPC 06251	EPD 06251	EPB 10251	EPC 10251	EPD 10251
	32	EPB 06321	EPC 06321	EPD 06321	EPB 10321	EPC 10321	EPD 10321
	40	EPB 06401	EPC 06401	EPD 06401	EPB 10401	EPC 10401	EPD 10401
	50	EPB 06501	EPC 06501	EPD 06501	EPB 10501	EPC 10501	EPD 10501
	63	EPB 06631	EPC 06631	EPD 06631	EPB 10631	EPC 10631	EPD 10631
2 POLE	2	EPB 06022	EPC 06022	EPD 06022	EPB 10022	EPC 10022	EPD 10022
	4	EPB 06042	EPC 06042	EPD 06042	EPB 10042	EPC 10042	EPD 10042
	10	EPB 06102	EPC 06102	EPD 06102	EPB 10102	EPC 10102	EPD 10102
	16	EPB 06162	EPC 06162	EPD 06162	EPB 10162	EPC 10162	EPD 10162
	20	EPB 06202	EPC 06202	EPD 06202	EPB 10202	EPC 10202	EPD 10202
	25	EPB 06252	EPC 06252	EPD 06252	EPB 10252	EPC 10252	EPD 10252
	32	EPB 06322	EPC 06322	EPD 06322	EPB 10322	EPC 10322	EPD 10322
	40	EPB 06402	EPC 06402	EPD 06402	EPB 10402	EPC 10402	EPD 10402
	50	EPB 06502	EPC 06502	EPD 06502	EPB 10502	EPC 10502	EPD 10502
	63	EPB 06632	EPC 06632	EPD 06632	EPB 10632	EPC 10632	EPD 10632
3 POLE	2	EPB 06023	EPC 06023	EPD 06023	EPB 10023	EPC 10023	EPD 10023
	4	EPB 06043	EPC 06043	EPD 06043	EPB 10043	EPC 10043	EPD 10043
	6	EPB 06063	EPC 06063	EPD 06063	EPB 10063	EPC 10063	EPD 10063
	10	EPB 06103	EPC 06103	EPD 06103	EPB 10103	EPC 10103	EPD 10103
	16	EPB 06163	EPC 06163	EPD 06163	EPB 10163	EPC 10163	EPD 10163
	20	EPB 06203	EPC 06203	EPD 06203	EPB 10203	EPC 10203	EPD 10203
	25	EPB 06253	EPC 06253	EPD 06253	EPB 10253	EPC 10253	EPD 10253
	32	EPB 06323	EPC 06323	EPD 06323	EPB 10323	EPC 10323	EPD 10323
	40	EPB 06403	EPC 06403	EPD 06403	EPB 10403	EPC 10403	EPD 10403
	50	EPB 06503	EPC 06503	EPD 06503	EPB 10503	EPC 10503	EPD 10503
	63	EPB 06633	EPC 06633	EPD 06633	EPB 10633	EPC 10633	EPD 10633
4 POLE	2	EPB 06024	EPC 06024	EPD 06024	EPB 10024	EPC 10024	EPD 10024
	4	EPB 06044	EPC 06044	EPD 06044	EPB 10044	EPC 10044	EPD 10044
	6	EPB 06064	EPC 06064	EPD 06064	EPB 10064	EPC 10064	EPD 10064
	10	EPB 06104	EPC 06104	EPD 06104	EPB 10104	EPC 10104	EPD 10104
	16	EPB 06164	EPC 06164	EPD 06164	EPB 10164	EPC 10164	EPD 10164
	20	EPB 06204	EPC 06204	EPD 06204	EPB 10204	EPC 10204	EPD 10204
	25	EPB 06254	EPC 06254	EPD 06254	EPB 10254	EPC 10254	EPD 10254
	32	EPB 06324	EPC 06324	EPD 06324	EPB 10324	EPC 10324	EPD 10324
	40	EPB 06404	EPC 06404	EPD 06404	EPB 10404	EPC 10404	EPD 10404
	50	EPB 06504	EPC 06504	EPD 06504	EPB 10504	EPC 10504	EPD 10504
	63	EPB 06634	EPC 06634	EPD 06634	EPB 10634	EPC 10634	EPD 10634

ORDERS CODES

MCB 80A, 100A, 125A ORDER CODES

		6kA			10kA		
		80A	100A	125A	80A	100A	125A
80A, 100A, 125A	1P	EP 06801	EP 061001	EP 061251	EP 10801	EP 101001	EP 101251
	2P	EP 06802	EP 061002	EP 061252	EP 10802	EP 101002	EP 101252
	3P	EP 06803	EP 061003	EP 061253	EP 10803	EP 101003	EP 101253
	4P	EP 06804	EP 061004	EP 061254	EP 10804	EP 101004	EP 101254

S G R	2	0 1 6	0 1 0	A C

EPR SERIES				
NUMBER OF POLES	1*	2	4	
RATING				
SENSITIVITY (mA)	010	030	100	300
TYPE	A	A C		

RCCB ORDER CODES

		2P		4P	
I n		AC TYPE	A TYPE	AC TYPE	A TYPE
10 mA	16	SGR2016010AC	SGR2016010A	SGR4016010AC	SGR4016010A
	20	SGR2020010AC	SGR2020010A	SGR4020010AC	SGR4020010A
30 mA	16	SGR2016030AC	SGR2016030A	SGR4016030AC	SGR4016030A
	25	SGR2025030AC	SGR2025030A	SGR4025030AC	SGR4025030A
	32	SGR2032030AC	SGR2032030A	SGR4032030AC	SGR4032030A
	40	SGR2040030AC	SGR2040030A	SGR4040030AC	SGR4040030A
	63	SGR2063030AC	SGR2063030A	SGR4063030AC	SGR4063030A
	80	SGR2080030AC	SGR2080030A	SGR4080030AC	SGR4080030A
	100	SGR2010030AC	SGR2100030A	SGR4100030AC	SGR4100030A
100 mA	16	SGR2016100AC	SGR2016100A	SGR4016100AC	SGR4016100A
	25	SGR2025100AC	SGR2025100A	SGR4025100AC	SGR4025100A
	32	SGR2032100AC	SGR2032100A	SGR4032100AC	SGR4032100A
	40	SGR2040100AC	SGR2040100A	SGR4040100AC	SGR4040100A
	63	SGR2063100AC	SGR2063100A	SGR4063100AC	SGR4063100A
	80	SGR2080100AC	SGR2080100A	SGR4080100AC	SGR4080100A
	100	SGR2100100AC	SGR2100100A	SGR4100100AC	SGR4100100A
300 mA	16	SGR2016300AC	SGR2016300A	SGR4016300AC	SGR4016300A
	25	SGR2025300AC	SGR2025300A	SGR4025300AC	SGR4025300A
	32	SGR2032300AC	SGR2032300A	SGR4032300AC	SGR4032300A
	40	SGR2040300AC	SGR2040300A	SGR4040300AC	SGR4040300A
	63	SGR2063300AC	SGR2063300A	SGR4063300AC	SGR4063300A
	80	SGR2080300AC	SGR2080300A	SGR4080300AC	SGR4080300A
	100	SGR2100300AC	SGR2100300A	SGR4100300AC	SGR4100300A

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For further information, please contact our sales department.