

LOADLINE Z2 AIR CIRCUIT BREAKER

Main Features

- IEC60947-2, EN60947-2, ASY=TA certified
- The ultimate in compactness and operational capability
- Increased accessibility from the front
- No extra arc space required permitting vertical stacking
- Main contacts can be easily replaced in the field
- Very fast interruption using "DoubleBreak" system.
- Enhanced selectivity with LSI characteristics as standard
- A substantial improvement in lifecycles and easy maintenance

This datasheet is to give a general overview only. For more detailed information on accessories and guidance with ordering codes please refer to full catalogue



Ratings & Technical Data

Standard Series		Z2							
Frame size		800		1250		1600		2000	
Ampere rating(A)		800		1250		1600		2000	
Rated current (max.) [I _n](A) IEC, EN, AS		800		1250		1600		2000	
	JIS	800		1250		1600		2000	
	NEMA, ANSI	800		1250		1540		2000	
	Marine	800		1250		1600		2000	
Neutral pole Amperes frame (A)		800		1250		1600		2000	
Number of poles		3		4		3		4	
Rated primary current of over-current Release [I _{cr}](A)		800		1250		1600		2000	
• for general feeder circuit use									
AC rated insulations voltage [U _i](V.50/60Hz)		1000		1000		1000		1000	
Rated operational voltage [U _o](V.50/60Hz)		690		690		690		690	
AC rated breaking cap [kA sym rms]/making cap [kA peak]		50/105		50/105		50/105		50/105	
	ac 690V	65/143		65/143		65/143		65/143	
	440V	65/143		65/143		65/143		65/143	
NEMA	ac 600V	42/96.6		42/96.6		42/96.6		42/96.6	
	480V	50/115		50/115		50/115		50/115	
	240V	65/149.5		65/149.5		65/149.5		65/149.5	
JIS	ac 550V	50/105		50/105		50/105		50/105	
	460V	65/143		65/143		65/143		65/143	
	220V	65/143		65/143		65/143		65/143	
	dc 600V	40/40		40/40		40/40		40/40	
	250V	40/40		40/40		40/40		40/40	
NK	ac 690V	50/115		50/115		50/115		50/115	
	450V	65/153		65/153		65/153		65/153	
LR, AB	ac 690V	50/115		50/115		50/115		50/115	
GL, BV	450V	65/153		65/153		65/153		65/153	
Rated impulse withstand voltage [U _{me}](kV)		12		12		12		12	
Rated short time withstand 1s current [I _{sw}](kA rms)		65		65		65		65	
	3s	50		50		50		50	
Latching current (kA)		65		65		65		65	
Total breaking time (s)		0.03		0.03		0.03		0.03	
Closing operation time									
Spring charging time (s) max.		10		10		10		10	
Close time (s) max.		0.08		0.08		0.08		0.08	
No. of operating cycles									
Mechanical life with maintenance		30000		30000		30000		25000	
without maintenance		15000		15000		15000		12000	
Electrical life without maintenance AC460V		12000		12000		12000		10000	
AC690V		10000		10000		10000		7000	
Weight (Kg) draw-out type		73	86	73	86	76	90	79	94

1 Values in open air at 40°C (45°C for marine applications).
 2 For double-pole ACBs use outside poles of three-pole ACB.
 3 Rated insulation voltage depends on applied standard: 1000V ac according to IEC 60947-2.
 4 Rated operational voltage depends on applied standard: 690V according to IEC 60947-2.
 5 Cannot apply IT earthing system, i.e. insulated from earth.
 6 For 500V ac.
 7 Please contact Dorman Smith for dc application.
 8 Three-poles in series should be applied for 600V dc.
 9 Applicable to only three-pole ACBs.

High Fault Series		(Available as Draw-out only)							
Frame size		1250		1600		2000			
Ampere rating(A)		1250		1600		2000			
Rated current (max.) [I _n](A) IEC, EN, AS		1250		1600		2000			
	JIS	1250		1600		2000			
	NEMA, ANSI	1250		1600		2000			
	Marine	1250		1600		2000			
Neutral pole Amperes frame (A)		1250		1600		2000			
Number of poles		3		4		3		4	
Rated primary current of over-current Release [I _{cr}](A)		1250		1600		2000			
• for general feeder circuit use									
AC rated insulations voltage [U _i](V.50/60Hz)		1000		1000		1000			
Rated operational voltage [U _o](V.50/60Hz)		690		690		690			
AC rated breaking cap [kA sym rms]/making cap [kA peak]		55/121		55/121		55/121			
	ac 690V	80/176		80/176		80/176			
	440V	80/176		80/176		80/176			
NEMA	ac 600V	42/96.6		42/96.6		42/96.6			
	480V	65/149.5		65/149.5		65/149.5			
	240V	80/184		80/184		80/184			
JIS	ac 550V	55/121		55/121		55/121			
	460V	80/176		80/176		80/176			
	220V	80/176		80/176		80/176			
	dc 600V	40/40		40/40		40/40			
	250V	40/40		40/40		40/40			
NK	ac 690V	55/128		55/128		55/128			
	450V	80/186		80/186		80/186			
LR, AB	ac 690V	55/128		55/128		55/128			
GL, BV	450V	80/186		80/186		80/186			
Rated impulse withstand voltage [U _{me}](kV)		12		12		12			
Rated short time withstand 1s current [I _{sw}](kA rms)		80		80		80			
	3s	55		55		55			
Latching current (kA)		65		65		65			
Total breaking time (s)		0.03		0.03		0.03			
Closing operation time									
Spring charging time (s) max.		10		10		10			
Close time (s) max.		0.08		0.08		0.08			
No. of operating cycles									
Mechanical life with maintenance		30000		30000		30000			
without maintenance		15000		15000		15000			
Electrical life without maintenance AC460V		12000		12000		12000			
AC690V		10000		10000		10000			
Weight (Kg) draw-out type		79	94	79	94	79	94	79	94

1 Values in open air at 40°C (45°C for marine applications).
 2 Values for draw-out type with vertical terminals.
 3 For double-pole ACBs use outside poles of three-pole ACB.
 4 Four-pole ACBs without Neutral phase protection can not be applied to IT earthing systems.
 5 Rated insulation voltage depends on applied standard: 1000V according to IEC 60947-2.
 6 Rated operational voltage depends on applied standard: 690V according to IEC 60947-2.
 7 Contact Dorman Smith for details.
 8 Please contact Dorman Smith for dc application.
 9 Three-poles in series should be applied for 600V dc.
 10 Will apply soon.
 11 Applicable to only three-pole ACBs.

When the ACB is used without Instantaneous trip function MCR should be set to work. The rated breaking capacity will reduce to the level of the latching current without MCR function.

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Protection functions	Setting range
Adjustable long time-delay trip characteristics	
[LT]	
Pick up current [I_{pL}] (A)	$[I_n] \times (0.8-0.85-0.9-0.95-1.0-NON)$; 6 graduations • Non tripping when load current $\leq ([IR] \times 1.05)$. • Tripping when $([IR] \times 1.05) <$ load current $\leq ([I_n] \times 1.2)$
Time-delay [t_{dL}] (s)	$(0.5-1.25-2.5-5-10-15-20-25-30)$ at 600% of [I_n]; 9 graduations
Time-delay setting tolerance (%)	+/- 15% +150ms-0ms
Adjustable short time-delay trip characteristics	
[ST]	
Pick up current [I_{pS}] (A)	$[I_n] \times (1-1.5-2-2.5-3-4-6-8-10- NON)$; 10 graduations
Current setting tolerance (%)	+/- 15%
Time-delay [t_{dS}] (ms) Relay time	50 100 200 400 600 800; 6 graduations
Resettable time (ms)	25 75 175 375 575 775
Max. total clearing time (ms)	120 170 270 470 670 870
Adjustable instantaneous trip characteristics	
[INST] or MCR (For AGR-11B, INST only)	
Pick up current [I] (A)	$[I_n] \times (2-4-6-8-10-12-14-16- NON)$; 9 graduations
Current setting tolerance (%)	+/- 20%
Adjustable pretrip alarm characteristics	$[I_n] \times (0.75-0.8-0.85-0.9-0.95-1.0)$; 6 graduations
Pick up current [I_{PI}] (A)	+/- 7.5%
Current setting tolerance (%)	$(5-10-15-20-40-60-80-120-160-200)$ at [I_{PI}] or more; 10 graduations
Time-delay [t_{PI}] (s)	+/- 15% +100ms - 0ms
Time-delay setting tolerance (%)	
Adjustable ground fault trip characteristics	
[GF]	
	Note: Set [I_{gI}] to 1200A or less
Pick up current [I_{gI}] (A)	$[I_{gI}] \times (0.1-0.2-0.3-0.4-0.6-0.8-1.0-NON)$; 8 graduations
Current setting tolerance (%)	+/- 20%
Time-delay [t_{gI}] (ms) Relay time	100 200 300 500 1000 200 ; 6 graduations
Resettable time (ms)	75 175 275 475 975 1975
Max. total clearing time (ms)	170 270 370 570 1070 2070
Ground fault trip characteristics on line side	
[REF] (AGR-21B, 31B only)	
Pick up current [I_{REF}] (A)	$[I_{gI}] \times (0.1-0.2-0.3-0.4-0.6-0.8-1.0-NON)$; 8 graduations
Current setting tolerance (%)	+/- 20%
Time-delay (s)	Inst
N-phase protection characteristics	
[NP]	
Pick up current [I_{nI}] (A) when load	$[I_{nI}] \times (0.4-0.5-0.63-0.8-1.0)$; Factory set to a user-specified value • Non tripping current $\leq ([I_{nI}] \times 1.05)$ • Tripping when $([I_{nI}] \times 1.05) <$ load current $\leq ([I_{nI}] \times 1.2)$
Time-delay [t_{nI}] (s)	Tripping at 600% of [I_{nI}] with LT time-delay [t_{dL}]
Time-delay setting tolerance (%)	+/- 15% +150ms - 0ms
Reverse phase protection characteristics	
[NS] (AGR-21B, 31B only)	
Pick up current [I_{nR}] (A)	$[I_n] \times (0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0)$; 9 graduations
Current setting tolerance (%)	+/- 10%
Time-delay [t_{nR}] (s)	$0.4-0.8-1.2-1.6-2-2.4-2.8-3.2-3.6-4$; 10 graduations
Time-delay setting tolerance (%)	+/- 20% +150ms-0ms
Adjustable earth leakage trip characteristics	
[ELT] (AGR-31B only)	
Pick up current [I_{eI}] (A)	$0.2-0.3-0.5-1$ (Medium sensitivity) or $3-5$ (Low sensitivity)
Current setting tolerance	Non operate below 50% of [I_{eI}], Operate between 50% and 100% of [I_{eI}]
Time-delay [t_{eI}] (ms) Relay time	100 200 300 500 1000 2000 ; 6 graduations
Resettable time (ms)	50 150 250 450 950 1950
Max. total clearing time (ms)	250 350 450 600 1150 2150
Under-voltage alarm characteristics	
[UV] (AGR-31B only)	
Recovery setting voltage (V)	$[V_n] \times (0.8-0.85-0.9-0.95)$; 4 graduations
Setting voltage (V)	$[V_n] \times (0.4-0.6-0.8)$; 3 graduations
Time-delay (s)	$0.1-0.5-1-2-5-10-15-20-30-36$; 10 graduations
Control power	
	AC100-120V) Common DC100-125V) Common AC200-240V) Common DC200-250V) Common
	DC48V) Common DC24V) Common
	Power consumption: 5 VA

DEFAULT SETTINGS _____

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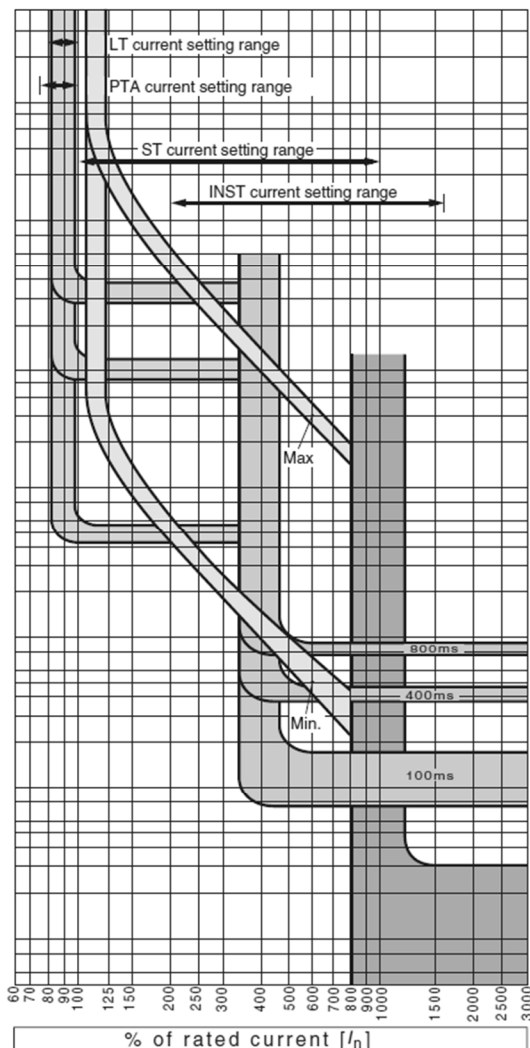
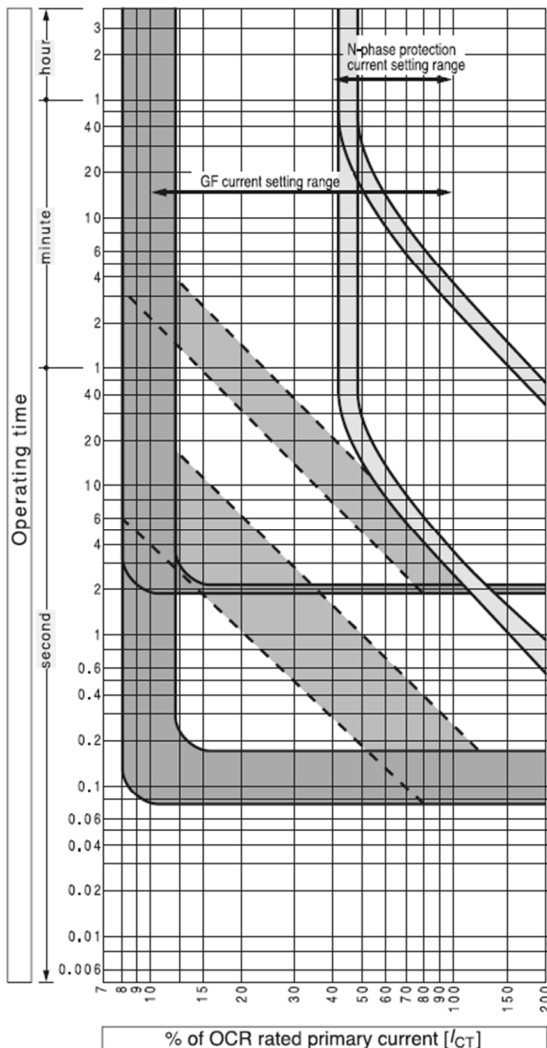
Values of $[I_{CT}]$ and $[I_n]$

Type	Applicable	Rated current $[I_n]$ (A)				
		$[I_{CT}]$ (A)	$[I_{CT}]$ X0.5	$[I_{CT}]$ X0.63	$[I_{CT}]$ X0.8	$[I_{CT}]$ X1.0
Z2 (STD)	800	400	500	630	800	
	1250	630	800	1000	1250	
	1600	800	1000	1250	1600	

Type	Applicable	Rated current $[I_n]$ (A)				
		$[I_{CT}]$ (A)	$[I_{CT}]$ X0.5	$[I_{CT}]$ X0.63	$[I_{CT}]$ X0.8	$[I_{CT}]$ X1.0
Z2 (STD)	2000	1000	1250	1600	2000	

Type	Applicable	Rated current $[I_n]$ (A)				
		$[I_{CT}]$ (A)	$[I_{CT}]$ X0.5	$[I_{CT}]$ X0.63	$[I_{CT}]$ X0.8	$[I_{CT}]$ X1.0
Z2 (HIGH)	1250	630	800	1000	1250	
Z2 (HIGH)	1600	800	1000	1250	1600	
Z2 (HIGH)	2000	1000	1250	1600	2000	

Protection Characteristics



The ST trip characteristic shown in the figure applies when the ramp characteristic select switch is in the OFF position.

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Outline Dimensions

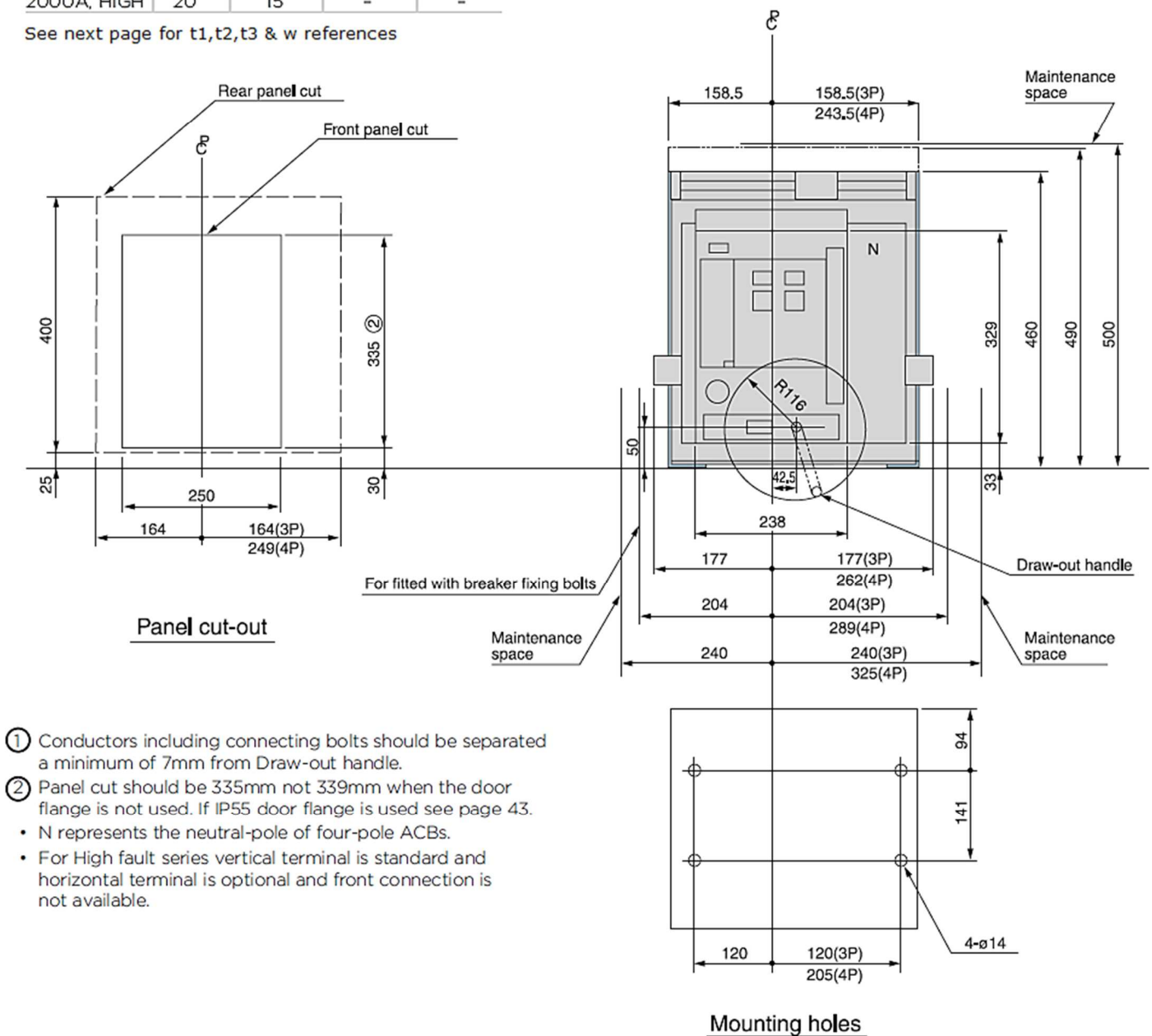
Z2 Draw-out

800A, 1250A, 1600A and 2000A standard series
1250A, 1600A & 2000A high series

Ⓢ: ACB Front cover centre line

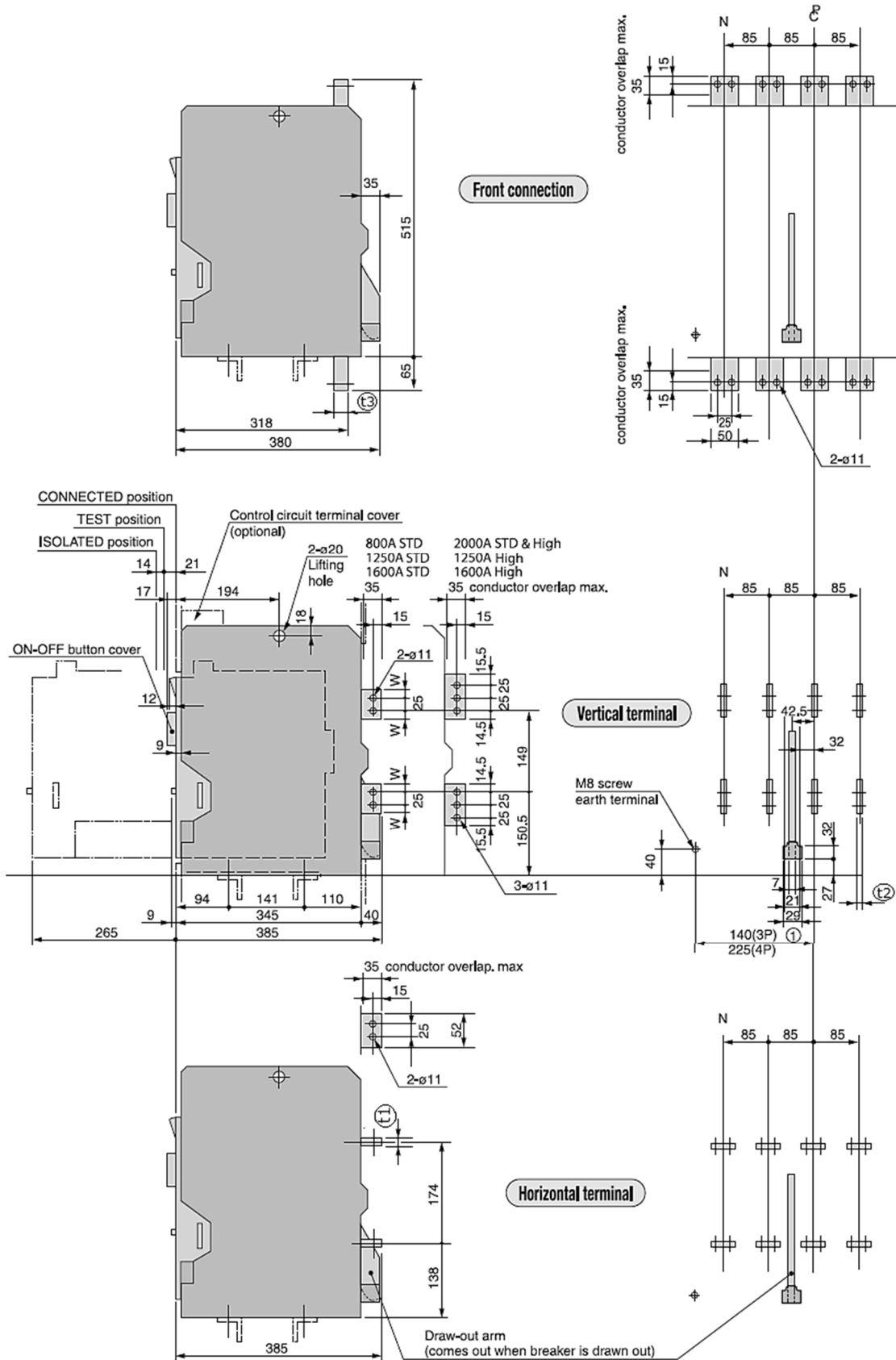
Terminal size	t1	t2	t3	w
800A, STD	10	10	15	17.5
1250A, STD	10	10	15	17.5
1600A, STD	20	15	25	22.5
2000A, STD	20	15	25	-
1250A, HIGH	20	15	-	-
1600A, HIGH	20	15	-	-
2000A, HIGH	20	15	-	-

See next page for t1,t2,t3 & w references



- ① Conductors including connecting bolts should be separated a minimum of 7mm from Draw-out handle.
- ② Panel cut should be 335mm not 339mm when the door flange is not used. If IP55 door flange is used see page 43.
 - N represents the neutral-pole of four-pole ACBs.
 - For High fault series vertical terminal is standard and horizontal terminal is optional and front connection is not available.

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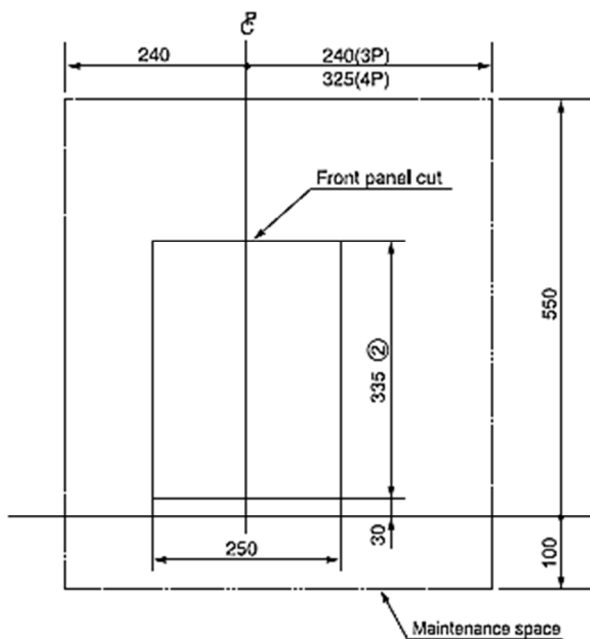
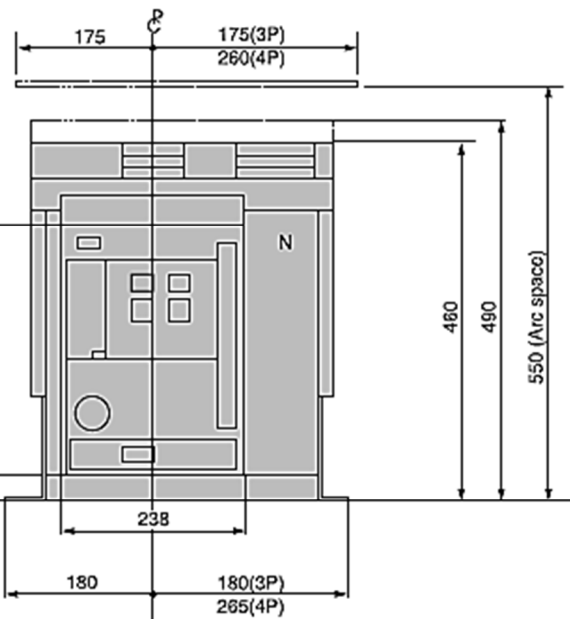
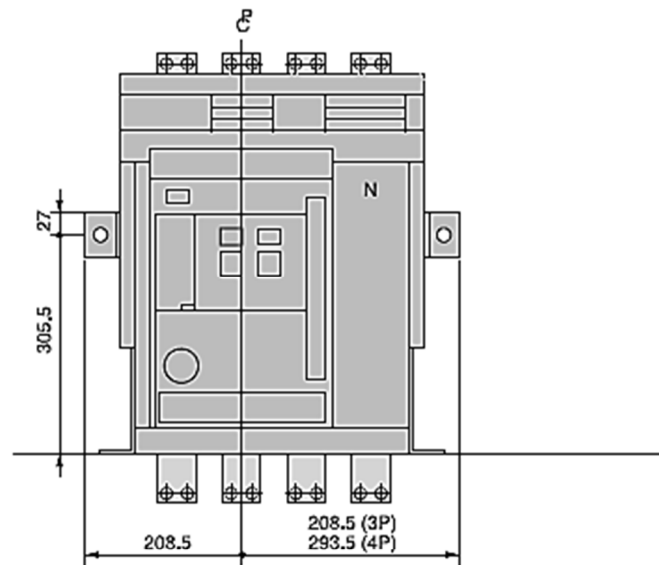
Z2 Fixed

800A, 1250A, 1600A and 2000A standard series

⌀: ACB Front cover centre line

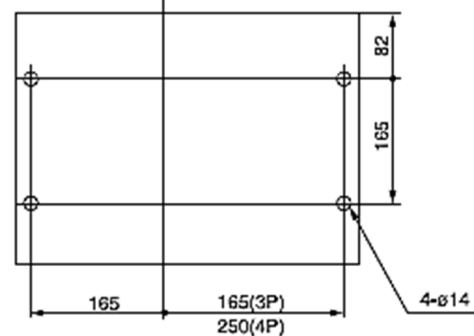
Terminal size	t1	t2	t3	w
800A, STD	10	10	15	17.5
1250A, STD	10	10	15	17.5
1600A, STD	20	15	25	22.5
2000A, STD	20	15	25	-

See next page for t1,t2,t3 & w references



Panel cut-out

- ② Panel cut should be 335mm not 339mm when the door flange is not used. If IP55 door flange is used see page 43.
- N represents the neutral-pole of four-pole ACBs.



Mounting holes

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