

■ **Overcurrent trip device (OCR)**

The AGR series of overcurrent trip device (OCR) featuring high reliability and multiple protection capabilities is available for DH series. Controlled by an internal 8-bit microprocessor, the OCR provides reliable protection against overcurrent. The OCR range is divided into three groups: L-characteristic, R-characteristic (both for general feeder) and S-characteristic (for generator protection).

Each group consists of:

Type AGR-11: Standard OCR with adjustment dial

Type AGR-21: Enhanced OCR with adjustment dial

Optional protection functions of the OCR include those against ground fault, earth leakage, undervoltage and reverse power.

Pre-trip alarm function can also be installed.

• **Types of tripping functions**

1. Adjustable long time-delay trip function (LT)

Effective value (RMS) detection used to accurately read through distorted waveforms.

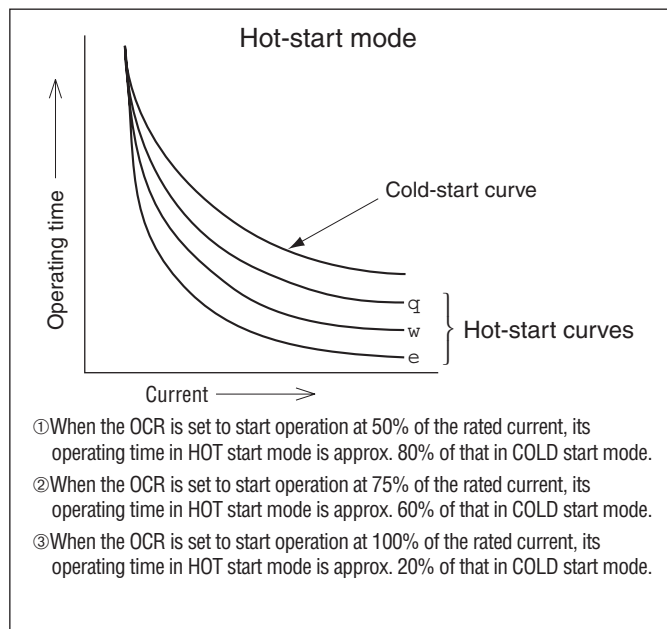
In addition to the standard L and S-characteristics, the R-characteristic is available in five types for long time-delay trip. The R-characteristic can be used to give selective tripping coordination with e.g., fuses. (See page 08/50.)

Hot-start mode (applicable to L-characteristic)

In the hot-start mode, when overcurrent occurs in a load state, the circuit breaker operates in a shorter amount of time as compared with operation in the cold-start mode. The hot-start mode is suitable to protect motors and wires from thermal damage.

The hot-start and cold-start modes can be switched easily with a switch. (The M-characteristic cannot be applied.)

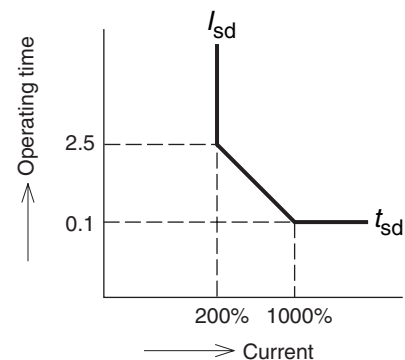
At shipment, the circuit breaker is set in the cold-start mode.



2. Adjustable short time-delay trip function (ST)

Ramp characteristic has been provided in addition to definite time-delay trip characteristic. The ramp characteristic gives coordinative protection with downstream circuit breakers or fuses properly. In type AGR-21L and AGR-21R OCRs, the definite time characteristic is activated when the load current is 1000% or more of the rated current [I_n] (500% or more of the rated current [I_n] for AGR-21S). The definite time-delay trip characteristic and ramp characteristic are selectable with a switch. The ST trip function is set to the definite time-delay trip characteristic at factory shipment.

Ramp characteristic curve
(L or R-characteristic)



3. Adjustable instantaneous trip function (INST/MCR)

The INST trip function trips the ACB, irrespective of the state of the ACB, when a short-circuit current exceeding the pick-up setting current flows. The MCR trips the ACB when a short-circuit current flows during ACB closing operation, and locks the ACB to keep it inoperative. INST and MCR are selectable with a switch.

Note: The MCR needs a control power. If the control power is lost, only the INST function operates.

4. Adjustable pre-trip alarm (PTA)

The pre-trip alarm function provides an alarm signal via the alarm contact (1NO-contact) when the load current exceeding a predetermined value lasts for a predetermined time. A 2-channel pre-trip alarm function is available for S-characteristic. This function can be used to adjust feeding to loads according to their priority.

The pre-trip alarm is automatically reset when the load current drops to the predetermined value.

Note that this function needs the control power.

5. Ground fault trip function (GF)

The peak value sensing is used (the residual current of each phase is detected).

The GF pickup current can be set between 10% and 100% of the CT rated primary current [I_{CT}].

<Ramp characteristic is added>

The ramp and definite time characteristics are switch selectable. The GF trip function comes into operation with the definite time characteristic when the load current reaches 100% or more of the CT rated primary current [I_{CT}]. The GF trip function is factory set to the definite time characteristic.

When using a 3-pole ACB in a 3-phase, 4-wire system, be sure to use an optional CT for neutral line. (See page 08/74.)

Note 1: The GF trip function comes usually with operation indications (LED and contact output). If you need nothing but ground fault indication without a ground fault tripping operation, specify at the time of ordering.

6. Earth leakage trip function (ELT)

(For AGR-21 only)

In conjunction with an external zero-phase current transformer (ZCT), the ELT function provides protection against earth leakage.

The ELT pickup current can be set at 0.2, 0.3, 0.5 and 1A (Medium sensitivity) or 3 and 5A (Low sensitivity).

This function needs the control power.

Note 1: For details on specifications of the external ZCT, contact FUJI.

Note 2: The ELT function comes usually with operation indications (LED and contact output). If you need nothing but earth leakage indications without earth leakage tripping operation, specify at the time of ordering.

Note 3: The ELT function is available up to 3200A rated current [I_n].

7. Reverse power trip function (RPT)

(For AGR-21 only.)

The RPT function protects 3-phase generators running in parallel against reverse power. The RPT pickup current can be set in seven levels: 4% through 10% of the generator rated power.

The applicable rated voltages are 100 - 120V AC, 200 - 240V AC, and 380 - 460V AC.

The RPT function comes usually with operation indications (LED and contact output).

Note 1: CT for RPT is provided as standard when you specify RPT for 800AF to 3200AF draw-out type. However, CT for RPT for 4000AF should be provided by you.

8. N-phase protection function (NP)

This NP function is available on 4-pole ACBs and prevents the neutral conductor from suffering damage or burnout due to overcurrent.

The NP trip pickup current can be set between 40% and 100% of the OCR rated primary current for L and R-characteristics or of the generator rated current for S-characteristic.

It is factory set to a value specified at the time of ordering.

Note 1: The NP trip function comes usually with operation indications (LED and contact output). The NP trip pickup current setting is shared by the LT trip function.

Note 2: The HOT start mode is available. The operating time for the NP trip function is linked to that for the LT trip function.

9. Adjustable type undervoltage trip function (UVT)

(For AGR-21 only.)

The applicable rated voltages are 100 - 120V AC, 200 - 240V AC, and 380 - 460V AC.

The UVT function trips the ACB when the UVT control voltage drops to a value equal to 65% of the rated value.

The operating time can be set in ten levels: "instantaneous" through 1 sec.

The ACB can be closed 2 sec. after the UVT control voltage has returned to the pick-up voltage.

Phase-loss protection is available by connecting R,S and T-phase.

Note 1: The UVT control power is shared by the reverse power trip function (if fitted).

Note 2: The UVT function comes usually with operation indications (LED and contact output).

Note 3: The UVT function trips the ACB when any phase is lost in case 3 phases are detected.

Note 4: For the fixed type undervoltage trip device for AGR-11 or no OCR, See page 08/58.

• NON setting and fail-safe feature

1. NON setting

Setting a trip pickup current setting dial to the NON position allows you to render the corresponding protection function inoperative.

Dials having the NON position include LT, ST, INST/MCR, and GF.

Appropriate NON setting will be a useful means for optimum selectivity.

• Field test function

Long time-delay trip, short time-delay trip, and instantaneous trip operations can be tested easily in the field.

- This function requires a control power supply.

10. Contact temperature monitoring function (HEAT)

(For AGR-21 only.)

The HEAT function prevents the ACB from suffering damage due to overheat.

It monitors the temperature of the ACB main contacts, and gives an alarm via an LED indicator and an output signal via the alarm contact (1NO-contact) when the temperature exceeds 155°C.

The alarm can be manually reset when the temperature drops to a normal temperature.

If you want to set the threshold temperature to a lower value, contact FUJI.

This function needs the control power.

2. Fail-safe feature

The OCR has a fail-safe mechanism in case setting dials are improperly set to the NON position.

- If the ST and INST trip pickup current setting dials are both set to NON, the fail-safe mechanism will activate the INST trip function to trip the ACB when a fault current equal to or more than 16 times the rated current [I_n] flows through the ACB.
- If the ST and MCR trip pickup current setting dials are both set to NON, the fail safe mechanism will activate the ST delay trip function to trip the ACB when a fault current equal to or more than 10 times (5 times for generator protection) the rated current [I_n] flows through the ACB.

Air Circuit Breakers

DH series

Operation Indication function

● Operation indication function

1. Indication via single contact

When the LT, ST, INST/MCR, or GF trip function is activated, an output is generated via 1NO-contact.

The 1NO-contact will turn off after 40ms or more.

A self-hold circuit is needed.

Contact ratings for operation indications (for AGR-11, 21)

Voltage (V)	Current (A)			
	1. Single contact		2. Individual contacts	
	Resistive load	Inductive load	Resistive load	Inductive load
250 AC	8	3	0.5	0.2
250 DC	0.3	0.15	0.27	0.04
125 DC	0.5	0.25	0.5	0.2
30 DC	5	3	2	0.7

2. Indication via individual contacts and LED indicators

When the LT trip, ST trip, INST/MCR trip, GF trip, ELT, RPT, UVT, pre-trip alarm, or contact temperature overheat alarm function is activated, the corresponding LED indicator turns on and output is generated via the corresponding contact.

The OCR also has a self-diagnostic feature that monitors the internal tripping circuits and electronic circuits. If detecting any fault in these circuits, this feature turns on the system alarm LED indicator. The control power is needed.

Operation indications

- : Self-hold *1
- ×: Auto-reset
- : Not applicable

Protection characteristic	L/R-characteristic		S-characteristic	
	LED	Contact	LED	Contact
LT • NP	○	○	○	× *2
ST	○	○	○	× *2
INST/MCR	○		○	
GF or ELT	○	○	–	–
UVT or Trip indicator	○	○	○	× *2 (UVT) ○ (Trip ind.)
RPT	–	–	○	× *2
PTA	×	×	×	×
PTA2 or spring charge indicator	×	×	×	×
Contact temperature monitoring	○	○	○	○
System alarm	○	○	○	○

Note *1: To reset indicators for AGR-11, press the reset button or disconnect the control supply. To reset indicators for AGR-21, press the reset button or bridge operation circuit terminals [12] and [23].

The ACB can be closed without reset of the indicators.

*2: The contact will turn off after 500ms or more. A self-hold circuit is needed.

3. Contact ratings of trip indicator for use with AGR-11 or without OCR

Voltage (V)	Switch contact ratings (A)	
	Resistive load	Inductive load
250 AC	6	3
250 DC	0.1	0.1
125 DC	0.5	0.5
30 DC	3	3

■ **Combination of overcurrent tripping device and indicator**

Application and characteristic	Type number	Protection function						Output indication				N-phase protection	Contact temperature monitoring	
		Long time delay	Pre-alarm	Ground fault	Earth leakage	Reverse power	Under voltage	1-contact for any trip	Individual contacts	Spring charge	Trip			
General feeder protection	L	11LAL	●						●		▲	▲	●	
		11LGL	●		●				●		▲	▲	●	
		11LPS	●	●						●	▲	▲	●	
		11LPG	●	●	●					●	▲	▲	●	
		21LPS	●	●						●	●	●	●	●
	21LPGU	●	●	●			●		●	●	▲*	●	●	
	21LPEL	●	●						●	●	●	●	●	
	21LPEM	●	●				●		●	●	●	●	●	
	R	11RAL □	●						●		▲	▲	●	
		11RGL □	●		●				●		▲	▲	●	
11RPS □		●	●						●	▲	▲	●		
11RPG □		●	●	●					●	▲	▲	●		
21RPG □		●	●	●				●	●	●	▲*	●		
Generator protection	S	11SAL	●					●		▲	▲			
		11SPS	●	●						●	▲	▲		
	21SPSU	●	●						●	●	▲*		●	
	21SPRU	●	●				●		●	●	▲*		●	
	21STRU	●	●				●		●	●	▲*		●	

Notes: ● Provided ▲ Optional
 □ Replace the □ mark in the type number by the following protective characteristic numbers (1 to 5).
 $I^{0.02t}$: 1 I_t : 2 I^{2t} : 3 I^{3t} : 4 I^{4t} : 5
 * Either trip output indicator or undervoltage tripping device is available.
 ▲ When ordering the optional accessories, add the following codes to end of type number.
 Spring charge indicator: spring charge
 Trip indicator: trip
 N-phase protection: N
 Contact temperature monitoring: O

■ **Overcurrent trip device type/code**



*1 AGR-11L-AL: Overcurrent trip device only
 *2 11LAL: ACB with the overcurrent trip device

■ **Ordering information**

- Specify the following:
1. Type number
 2. Applied standard
 3. Main circuit voltage and breaking capacity
 4. Optional accessories for main device and OCR
 5. Voltage of each device
 6. External accessories

Air Circuit Breakers

DH series

■ Characteristics of overcurrent trip device

For general feeder circuit/L-characteristic (Type AGR-11L, 21L)

Protection function		Setting range
Adj. long time delay LT	Pick-up current I_R (A) Time delay t_R (s) Tolerance of t_R (%)	$I_R \times (0.8 - 0.85 - 0.9 - 0.95 - \underline{1.0} - \text{NON})$, 6 steps • Non-tripping at $I_R \times 1.05$ or less • Tripping between over $1.05I_R$ and $1.2I_R$ or less (0.5 — 1.25 — 2.5 — 5 — 10 — 15 — 20 — 25 — 30) at 600% $\times I_R$, 9 steps $\pm 15\%$ +150ms -0ms
Adj. short time delay ST	Pick-up current I_{sd} (A) Tolerance of I_{sd} (%) Time delay t_{sd} (ms) Relay time (ms) Resettable time (ms) Total fault clearing time (ms)	$I_R \times (1 - 1.5 - 2 - 2.5 - 3 - 4 - \underline{6} - 8 - 10 - \text{NON})$, 10 steps $\pm 15\%$ 50 100 200 400 600 800, 6steps 25 75 175 375 575 775 120 170 270 470 670 870
Adj. instantaneous trip INST or MCR	Pick-up current I_i (A) Tolerance of I_i (%)	$I_R \times (2 - 4 - 6 - 8 - 10 - 12 - 14 - \underline{16} - \text{NON})$, 9 steps $\pm 20\%$
Adj. pre-trip alarm PTA	Pick-up current I_{P1} (A) Tolerance of I_{P1} (%) Time delay t_{P1} (s) Tolerance of t_{P1} (%)	$I_R \times (0.75 - 0.8 - 0.85 - 0.9 - \underline{0.95} - 1.0)$, 6 steps $\pm 7.5\%$ (5 — 10 — 15 — 20 — 40 — 60 — 80 — <u>120</u> — 160 — 200) at I_{P1} or more, 10 steps $\pm 15\%$ +100ms -0ms
Adj. ground fault trip GF	Pick-up current I_g (A) Tolerance of I_g (%) Time delay t_g (ms) Relay time (ms) Resettable time (ms) Total fault clearing time (ms)	$I_{CT} \times (0.1 - \underline{0.2} - 0.3 - 0.4 - 0.6 - 0.8 - 1.0 - \text{NON})$, 8 steps $\pm 20\%$ 100 200 300 500 1000 2000, 6 steps 75 175 275 475 975 1975 170 270 370 570 1070 2070
Neutral phase protection function NP	Pick-up current I_N (A) Time delay t_N (s) Tolerance of t_N (%)	$I_{CT} \times (0.4 - 0.5 - 0.63 - 0.8 - 1.0)$ Factory set to a user-specified value • Non-tripping at $1.05I_N$ or less • Tripping range: Between over $1.05I_N$ and $1.2I_N$ or less Long time delay (LT) trip at 600% of I_N $\pm 15\%$ +150ms -0ms
Adj. earth leakage trip ELT	Pick-up current $I_{\Delta R}$ (A) Current setting tolerance (%) Time delay $t_{\Delta R}$ (ms) Relay time (ms) Resettable time (ms) Max. total clearing time (ms)	0.2 — 0.3 — <u>0.5</u> — 1.0 (Medium sensitivity) or 3 — 5 (Low sensitivity) • Non operate below 50% of $I_{\Delta R}$, Operate between 50% and 100% of $I_{\Delta R}$ 100 200 300 500 1000 2000, 6 steps 50 150 250 450 950 1950 250 350 450 600 1150 2150
Undervoltage trip UVT (AGR21only)	Pick-up voltage (V) Time delay time (s)	UVT rated supply voltage $U_c \times (0.8 - \underline{0.85} - 0.9 - 0.95)$, 4 steps 0 — 0.1 — 0.2 — 0.3 — 0.4 — <u>0.5</u> — 0.6 — 0.7 — 0.8 — 1.0, 10 steps
Control power		100 to 120V AC common 100 to 125V DC common 24V DC common 200 to 240V AC 200 to 250V DC 48V DC Power consumption: 5VA

— : Default setting

■ Values of $[I_{CT}]$ and $[I_N]$

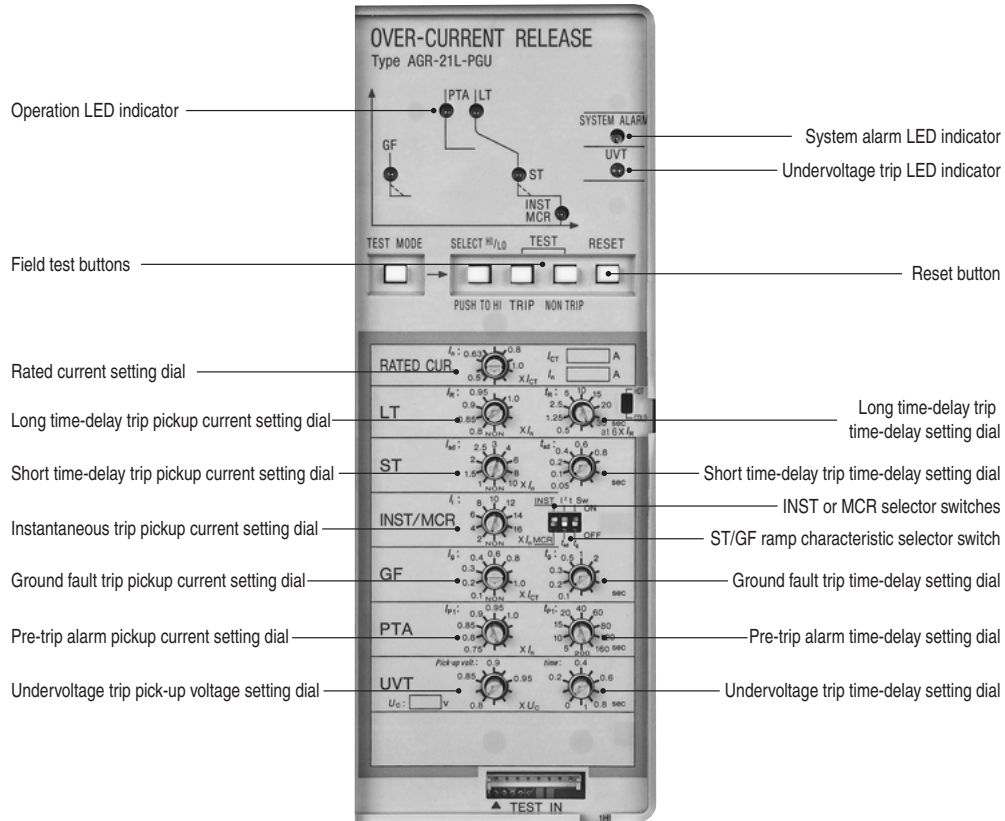
Type	Applicable	Rated current $[I_N]$ (A)				
		$[I_{CT}]$ (A)	$[I_{CT}]$ X 0.5	$[I_{CT}]$ X 0.63	$[I_{CT}]$ X 0.8	$[I_{CT}]$ X 1.0
DH08	200	100	125	160	200	
	400	200	250	320	400	
	800	400	500	630	800	
DH12	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
DH16	400	200	250	320	400	
	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)	$[I_{CT}]$ X 0.5	$[I_{CT}]$ X 0.63	$[I_{CT}]$ X 0.8	$[I_{CT}]$ X 1.0
DH20	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
	1600	800	1000	1250	1600	
DH25	2500	1250	1600	2000	2500	
DH30	3200	1600	2000	2500	3200	
DH40	4000	2000	2500	3200	4000	

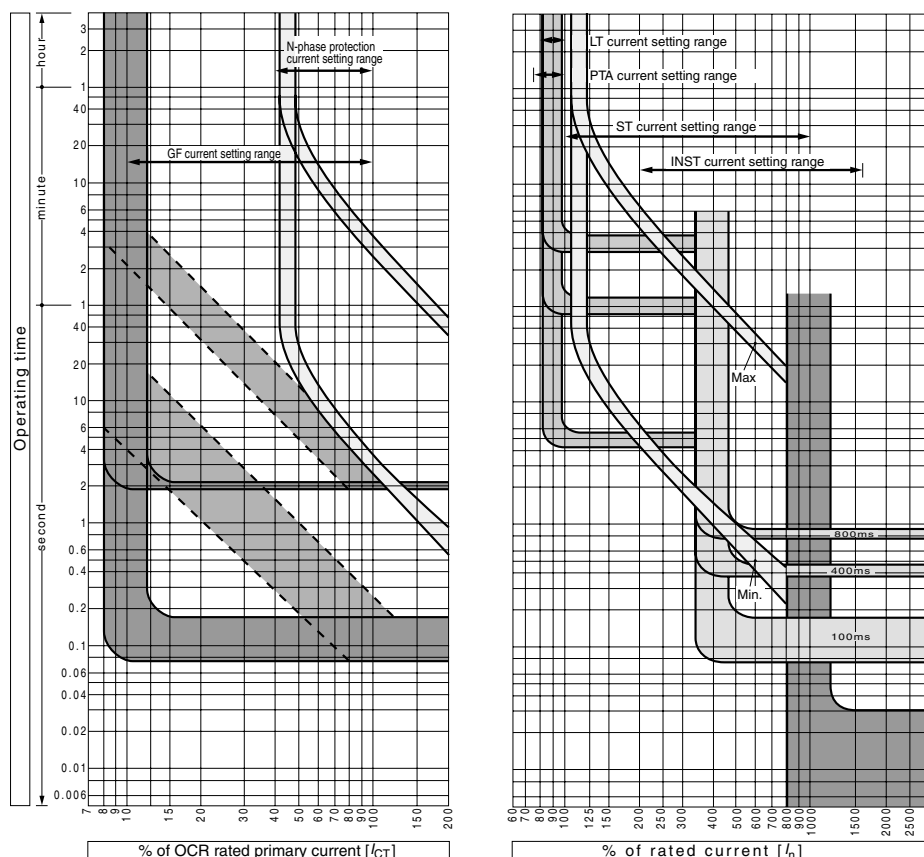
Type	Applicable	Rated current $[I_N]$ (A)				
		$[I_{CT}]$ (A)	$[I_{CT}]$ X 0.5	$[I_{CT}]$ X 0.63	$[I_{CT}]$ X 0.8	$[I_{CT}]$ X 1.0
DH12-H	200	100	125	160	200	
	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
DH16-H	1600	800	1000	1250	1600	
DH20-H	2000	1000	1250	1600	2000	
DH16-P	200	100	125	160	200	
	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
	1600	800	1000	1250	1600	
DH20-P	2000	1000	1250	1600	2000	
DH25-P	2500	1250	1600	2000	2500	
DH30-P	3200	1600	2000	2500	3200	

— : Default setting

Front face of overcurrent tripping device (OCR)



Protection characteristics



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

Air Circuit Breakers

DH series

■ Characteristics of overcurrent trip device

For general feeder circuit/R-characteristic (Type AGR-11R, 21R)

Protection function		Setting range
Adj. long time delay LT	Pick-up current I_R (A)	Select one from among I^{002}_t , I_t , I^2_t , I^3_t , and I^4_t by selector switch. $I_R \times (0.8 - 0.85 - 0.9 - 0.95 - \underline{1.0} - 1.1 - \text{NON})$, 6 steps • Non-tripping at $I_R \times 1.05$ or less • Tripping between over $1.05I_R$ and $1.2I_R$ or less
	Time delay t_R (s) Tolerance of t_R (%)	(1 — 2 — 3 — 4 — 5 — <u>6</u> — 7 — 8 — 10 — 13) at $300\% \times I_R$, 10 steps $\pm 20\%$ +150ms -0ms
Adj. short time delay ST	Pick-up current I_{sd} (A) Tolerance of I_{sd} (%)	$I_R \times (1 - 1.5 - 2 - 2.5 - 3 - 4 - \underline{6} - 8 - 10 - \text{NON})$, 10 steps $\pm 15\%$
	Time delay t_{sd} (ms) Relay time (ms) Resettable time (ms) Total fault clearing time (ms)	50 100 200 400 600 800, 6 steps 25 75 175 375 575 775 120 170 270 470 670 870
Adj. instantaneous trip INST or MCR	Pick-up current I_i (A) Tolerance of I_i (%)	$I_R \times (2 - 4 - 6 - 8 - 10 - 12 - 14 - \underline{16} - \text{NON})$, 9 steps $\pm 20\%$
Adj. pre-trip alarm PTA	Pick-up current I_{P1} (A) Tolerance of I_{P1} (%) Time delay t_{P1} (s) Tolerance of t_{P1} (%)	$I_R \times (0.75 - 0.8 - 0.85 - 0.9 - \underline{0.95} - 1.0)$, 6 steps $\pm 7.5\%$ (5 — 10 — 15 — 20 — 40 — 60 — 80 — <u>120</u> — 160 — 200) at I_{P1} or more, 10 steps $\pm 15\%$ +100ms -0ms
Adj. ground fault trip GF	Pick-up current I_g (A) Tolerance of I_g (%)	$I_{CT} \times (0.1 - \underline{0.2} - 0.3 - 0.4 - 0.6 - 0.8 - 1.0 - \text{NON})$, 8 steps $\pm 20\%$
	Time delay t_g (ms) Relay time (ms) Resettable time (ms) Total fault clearing time (ms)	100 200 <u>300</u> 500 1000 2000, 6 steps 75 175 275 475 975 1975 170 270 370 570 1070 2070
Neutral phase protection function NP	Pick-up current I_N (A) Time delay t_N (s) Tolerance of t_N (%)	$I_{CT} \times (0.4 - 0.5 - 0.63 - 0.8 - 1.0)$ Factory set to a user-specified value • Non-tripping at $1.05 I_N$ or less • Tripping between over $1.05 I_N$ and $1.2 I_N$ or less Long time delay (LT) trip at 300% of I_N $\pm 20\%$ +150ms -0ms
Undervoltage trip UVT (AGR21only)	Pick-up voltage (V)	UVT rated supply voltage $U_c \times (0.8 - \underline{0.85} - 0.9 - 0.95)$, 4 steps
	Time delay time (s)	0 — 0.1 — 0.2 — 0.3 — 0.4 — <u>0.5</u> — 0.6 — 0.7 — 0.8 — 1.0, 10 steps
Control power		100 to 120V AC common 100 to 125V DC common 24V DC common 200 to 240V AC 200 to 250V DC 48V DC common Power consumption: 5VA

___ : Default setting

■ Values of $[I_{CT}]$ and $[I_N]$

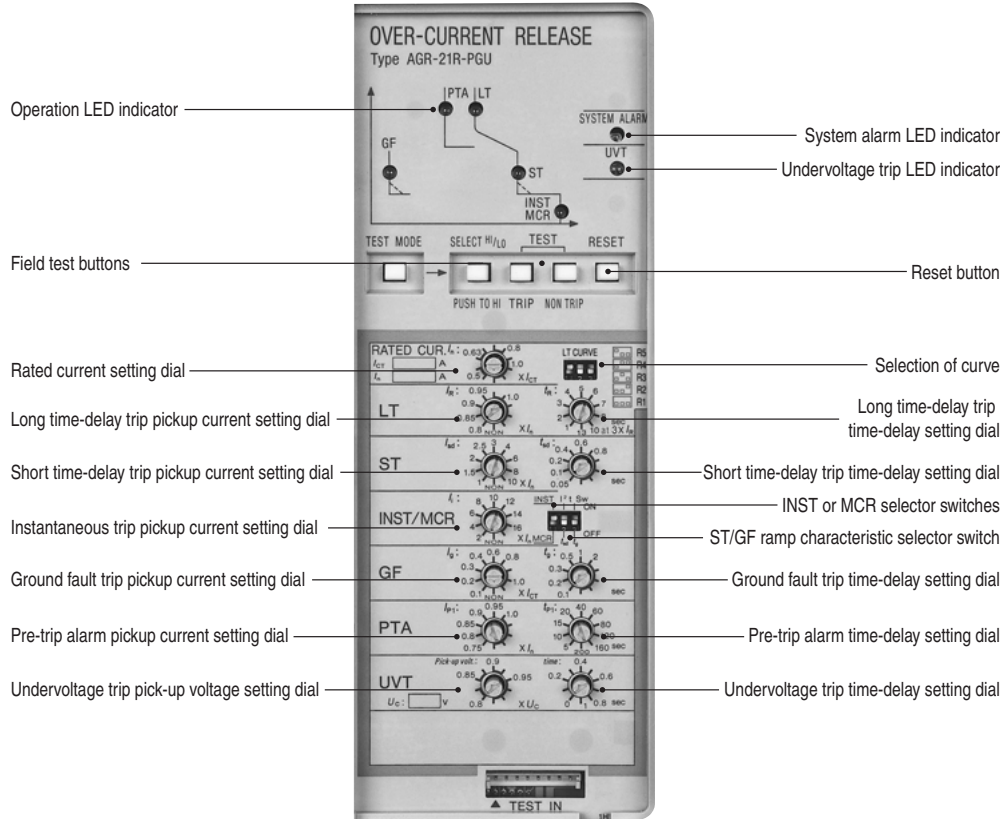
Type	Applicable (A)	Rated current $[I_N]$ (A)				
		$[I_{CT}]$ X 0.5	$[I_{CT}]$ X 0.63	$[I_{CT}]$ X 0.8	$[I_{CT}]$ X 1.0	$[I_{CT}]$
DH08	200	100	125	160	200	
	400	200	250	320	400	
	800	400	500	630	800	
DH12	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
DH16	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	

Type	Applicable (A)	Rated current $[I_N]$ (A)				
		$[I_{CT}]$ X 0.5	$[I_{CT}]$ X 0.63	$[I_{CT}]$ X 0.8	$[I_{CT}]$ X 1.0	$[I_{CT}]$
DH20	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
	1600	800	1000	1250	1600	
	2000	1000	1250	1600	2000	
DH25	2500	1250	1600	2000	2500	
DH30	3200	1600	2000	2500	3200	
DH40	4000	2000	2500	3200	4000	

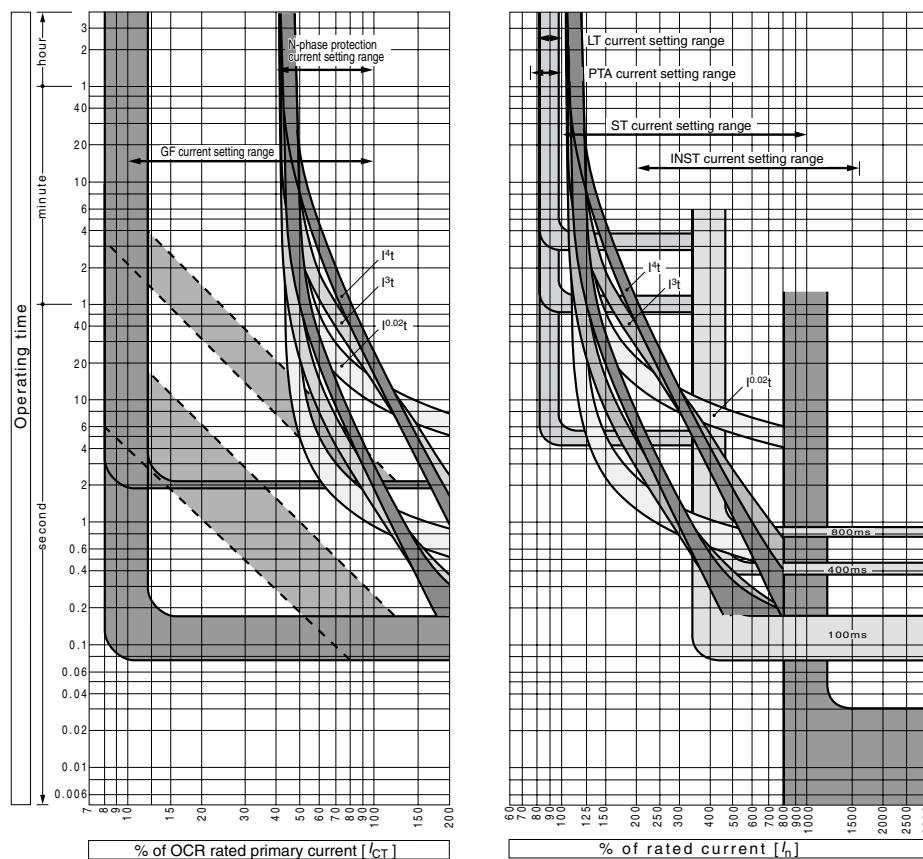
Type	Applicable (A)	Rated current $[I_N]$ (A)				
		$[I_{CT}]$ X 0.5	$[I_{CT}]$ X 0.63	$[I_{CT}]$ X 0.8	$[I_{CT}]$ X 1.0	$[I_{CT}]$
DH12-H	200	100	125	160	200	
	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
DH16-H	1600	800	1000	1250	1600	
DH20-H	2000	1000	1250	1600	2000	
DH16-P	200	100	125	160	200	
	400	200	250	320	400	
	800	400	500	630	800	
	1250	630	800	1000	1250	
	1600	800	1000	1250	1600	
DH20-P	2000	1000	1250	1600	2000	
DH25-P	2500	1250	1600	2000	2500	
DH30-P	3200	1600	2000	2500	3200	

___ : Default setting

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Protection characteristics



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

Air Circuit Breakers

DH series

■ Characteristics of overcurrent trip device

For general feeder circuit/S-characteristic (Type AGR-11S, 21S)

Protection function		Setting range
Adj. long time delay LT	Pick-up current I_R (A) Tolerance (%) Time delay t_R (s) Tolerance of t_R (%)	$I_n \times (0.8 - 1.0 - 1.05 - 1.1 - \underline{1.15} - \text{NON})$, 6 steps $\pm 5\%$ (15 — 20 — 25 — 30 — 40 — 50 — 60) at 120% $\times I_R$, 7 steps $\pm 15\% + 150\text{ms} - 0\text{ms}$
Adj. short time delay ST	Pick-up current I_{sd} (A) Tolerance of I_{sd} (%) Time delay t_{sd} (ms) Relay time (ms) Resettable time (ms) Total fault clearing time (ms)	$I_n \times (2 - 2.5 - 2.7 - 3 - 3.5 - 4 - \underline{4.5} - 5 - \text{NON})$, 9 steps $\pm 10\%$ 100 200 300 400 600 800, 6 steps 75 175 275 375 575 775 170 370 270 470 670 870
Adj. instantaneous trip INST or MCR	Pick-up current I_i (A) Tolerance of I_i (%)	$I_n \times (2 - 4 - 6 - 8 - 10 - 12 - 14 - \underline{16} - \text{NON})$, 9 steps $\pm 20\%$
Adj. pre-trip alarm PTA	Pick-up current I_{P1} (A) Tolerance of I_{P1} (%) Time delay t_{P1} (s) Tolerance of t_{P1} (%)	$I_n \times (0.75 - 0.8 - 0.85 - 0.9 - \underline{0.95} - 1.0 - 1.05)$, 7 steps $\pm 5\%$ (10 — 15 — 20 — 25 — 30) at 12% of I_{P1} , 5 steps $\pm 15\% + 100\text{ms} - 0\text{ms}$
Adj. pre-trip alarm PTA2 (AGR-21 only)	Pick-up current I_{P2} (A) Tolerance of I_{P2} (%) Time delay t_{P2} (s) Tolerance of t_{P2} (%)	$I_n \times (0.75 - 0.8 - 0.85 - 0.9 - \underline{0.95} - 1.0 - 1.05 - \text{NON})$, 8 steps $\pm 5\%$ 1.5 t_{P1} at 120% of t_{P2} $\pm 15\% + 100\text{ms} - 0\text{ms}$
Adj. reverse power trip PRT (AGR-21 only)	Pick-up power P_R (A) Power setting tolerance (%) Time delay (s) Tolerance (%)	Rated power (P_n) $\times (0.04 - 0.05 - 0.06 - 0.08 - 0.09 - 0.1 - \text{NON})$: 8 steps $+0 - 20\%$ (2.5 — 5 — 7.5 — 10 — 12.5 — 15 — 17.5 — 20) at 100% of P_R , 8 steps $\pm 20\%$
Undervoltage trip UVT (AGR-21 only)	Pick-up voltage (V) Time delay time (s)	UVT rated supply voltage $U_c \times (0.8 - \underline{0.85} - 0.9 - 0.95)$, 4 steps 0 — 0.1 — 0.2 — 0.3 — <u>0.4</u> — 0.5 — 0.6 — 0.7 — 0.8 — 1.0, 10 steps
Control power		100 to 120V AC common 100 to 125V DC common 24V DC common 200 to 240V AC common 200 to 250V DC common 48V DC common Power consumption: 5VA

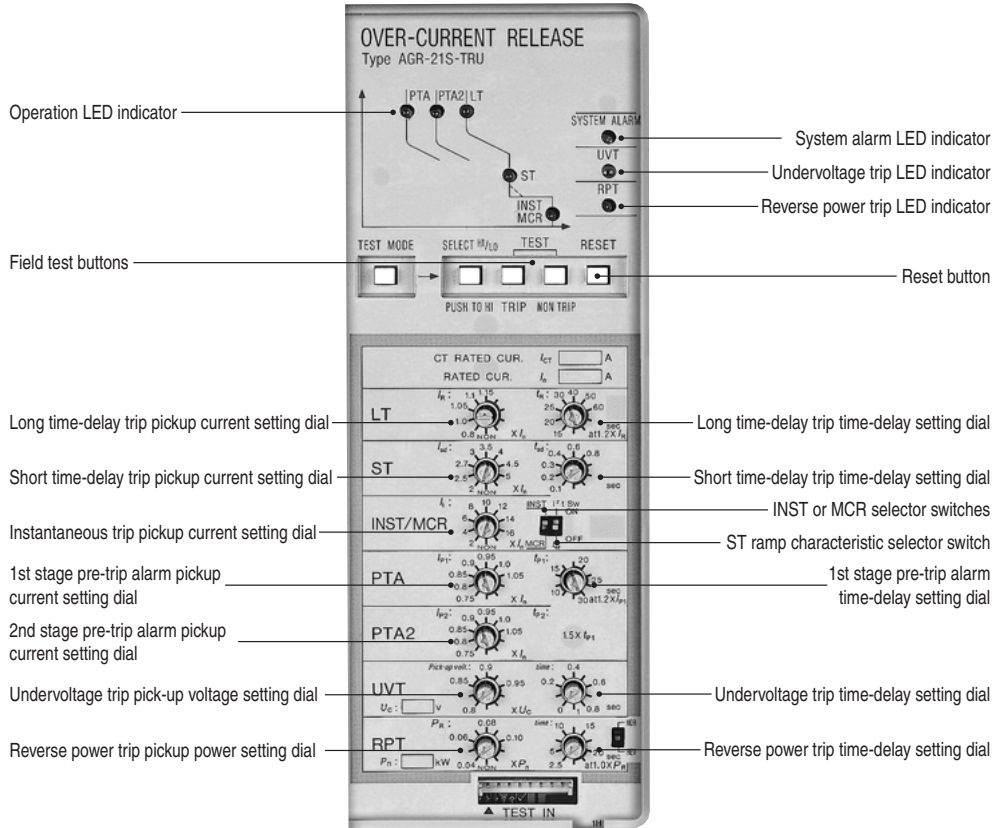
___ : Default setting

Applicable range of generator rated current [I_n]

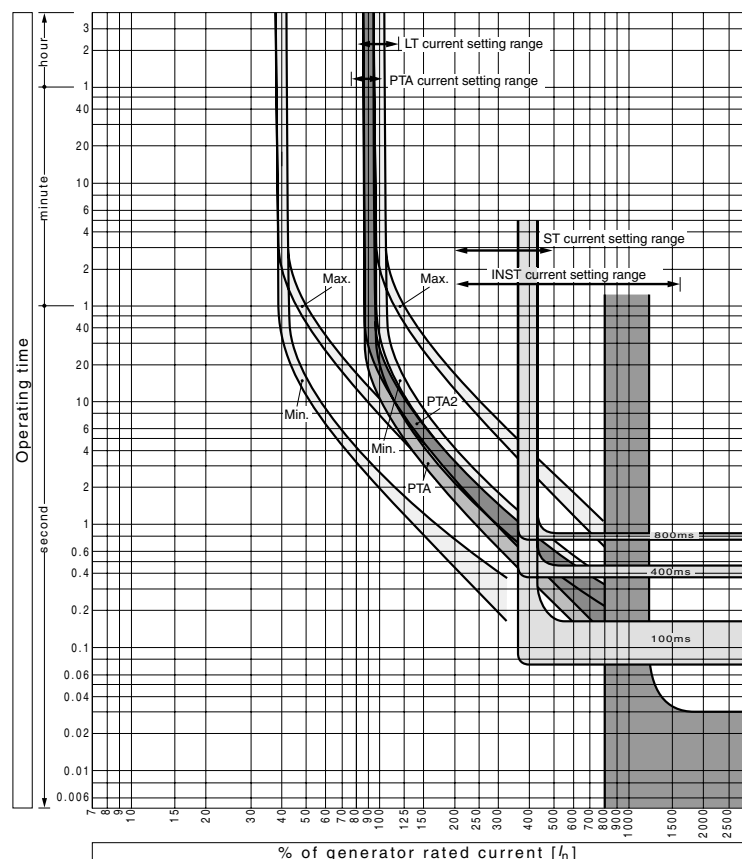
Type	OCR rated primary current [I_{CT}](A)	Applicable range of generator rated current [I_n] (A)
DH08	200	100 [I_n] 200
	400	200 < [I_n] 400
	800	400 < [I_n] 800
DH12	400	200 [I_n] 400
	800	400 < [I_n] 800
	1250	630 < [I_n] 1250
DH16	400	200 [I_n] 400
	800	400 < [I_n] 800
	1250	630 < [I_n] 1250
	1600	800 [I_n] 1600
DH20	400	200 [I_n] 400
	800	400 < [I_n] 800
	1250	630 < [I_n] 1250
	1600	800 [I_n] 1600
	2000	1250 [I_n] 2000
DH25	2500	1250 [I_n] 2500
DH30	3200	1600 [I_n] 3200
DH40	4000	2000 [I_n] 4000

Type	OCR rated primary current [I_{CT}](A)	Applicable range of generator rated current [I_n] (A)
DH12-H	200	100 [I_n] 200
	400	200 < [I_n] 400
	800	400 < [I_n] 800
	1250	630 < [I_n] 1250
DH16-H	1600	800 [I_n] 1600
DH20-H	2000	1000 [I_n] 2000
DH16-P	200	100 [I_n] 200
	400	200 < [I_n] 400
	800	400 < [I_n] 800
	1250	630 < [I_n] 1250
	1600	800 < [I_n] 1600
DH20-P	2000	1000 [I_n] 2000
DH25-P	2500	1250 [I_n] 2500
DH30-P	3200	1600 [I_n] 3200

Front face of overcurrent trip device (OCR)



Protection characteristics



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