

Protective Relays

QH series

General information

QH series protective relays

■ Description

FUJI overcurrent relays and voltage relays have inverse-time characteristics (induction and static types). The QH series is compact budget priced version and is easily installed on panels. It is drum-shaped and ideally suited for general industrial applications. The directional ground-fault relay (DG) is used, combined with zero-phase current transformer (ZCT) and zero-phase potential input device (ZPD). The ground-fault relay (GR) is used, combined with zero-phase current transformer (ZCT).



■ Specifications

● Overcurrent relays

Type	QH-OC1		QH-OC2
Trip system	Shunt trip		Current trip
Rated current	5A		
Rated frequency	50/60Hz		
Inverse time-lag element	Setting range	3-3.5-4-4.5-5-6A	
	Time-lag setting	0.5-1-2-3-4-5-6-7-8-9-10-15-20-30-40-50 (16 steps)	
	Operate time	300% overcurrent: 10s ± 17% or less, 700% overcurrent: 1.67s ± 12% or less at min. operating current and time-lag setting = 10	
Instantaneous element	Operate characteristic	Extremely inverse time-lag	
	Setting range	20-30-40-50-60-Lock	
Indication	Operate time	200%, 0.05s or less	
	Start, time-lag elapsed, operate, power, alarm		
Contact	For trip QH-OC1: 1NO QH-OC2: 2NC	Making capacity 10A at 100V DC, 220V DC (L/R=7ms) Breaking capacity 1A at 110V DC (L/R=7ms) 3.5A at 220V AC (cosφ=0.4)	Breaking capacity 60A at 110V AC (depending on CT burden)
	For alarm, 1NO	2A at 24V DC (max. 30W at 125V DC) (L/R=7ms) 2A at 100V AC (max. 220VA at 250V AC) (cosφ=0.4)	
Consumed VA	2VA (at 5A)		2VA (at 5A)
Mass	1.1kg		1.1kg

● Voltage relays

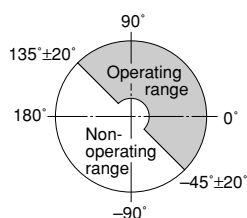
Type	Overvoltage relay		Undervoltage relay
Type	QH-OV1		QH-UV1
Trip system	Shunt trip		
Rate voltage	110V AC		110V AC
Setting range	115-120-125-130-135-140-150V		60-65-70-75-80-85-90-95-100V
Operate time setting	0.1-0.2-0.5-1-1.5-2-2.5-3-4-5-6-8-10s		0.1-0.2-0.5-1-1.5-2-2.5-3-4-5-6-8-10s
Indication	Start, operate, power		
Contact	For trip: 1NO	Making capacity 5A at 250V AC (cosφ = 0.4)	
	For alarm: 1NO	Breaking capacity 2A at 250V AC (cosφ = 0.4)	
Consumed VA	2VA		4VA
Mass	1kg		1.1kg

■ **Specifications**

● **Directional ground-fault relays**

Type	QH-DG3 (for receiving circuit)		QH-DG4 *(for branching circuit)
Trip system	Shunt trip, current trip		
Zero-phase voltage setting range	2.5-5-7.5-10-12.5% of zero-phase voltage 3810V at full ground-fault		-
Zero-phase current setting range	0.1-0.2-0.3-0.4-0.6A (ZCT primary side)		
Operating time setting	Insnt.-0.2-0.3-0.4-0.6s		
Operating characteristic	Operating time	±30ms at 130% current setting value -40ms to +0ms at 400% current setting value (when 150% of voltage setting value applied)	
	Zero-phase current	Within ±10% of current setting value (when 150% of voltage setting value applied)	
	Zero-phase voltage	Within ±25% of voltage setting value (when 150% of current setting value applied)	
Indication	Operate, zero-phase current/voltage, power		
Resetting method	Auto-manual (selectable by a switch)		
Test button	Provided		
Contact	For shunt trip: 1NO	Making capacity: 10A at 110V AC Breaking capacity: 7.5A at 110V AC ($\cos\phi = 0.4$), 0.4A at 125V DC (L/R= 7ms)	
	For current trip: 2PDT	7.5A at 110V AC ($\cos\phi = 0.5$)	
	For alarm: 1NO	Making capacity: 1.5A at 110V AC ($\cos\phi = 0.4$), 0.1A at 125V DC (L/R= 7ms)	
Rated control voltage	110V AC 50/60Hz		
Frequency	50Hz-60Hz (changeable by a switch)		
Operate phase angle	Non grounded system: Lag $45^\circ \pm 20^\circ$, lead $135^\circ \pm 20^\circ$ PC grounded system: Lag $70^\circ \pm 15^\circ$, lead $110^\circ \pm 15^\circ$		
Consumed VA	7VA (at operating)		6VA (at operating)
Mass	1.9kg		1.9kg

Operating phase angle (non grounded system)



* The QH-DG4 will function as branching unit for power receiving use QH-DG3. It cannot be used solely.

● **Accessories, sold separately**

Zero-phase current transformers

Description	Primary current (A)	Rated primary voltage (kV)	Dielectric strength	Over-current constant	Type	Mass (kg)
Round-hole through-type	100	3.3/6.6	22kV AC 1 min.	40	ZCT-561A	0.5
	200				ZCT-562A	0.5
	300	50/60Hz common use			ZCT-653	0.8
	400				ZCT-654	0.8
	600				ZCT-906	3.0
Split-toroidal type	100				ZCT-451D	0.9
	400				ZCT-654D	1.2

Zero-phase potential input device

Type	ZPD-1
Structure	Indoor use, epoxy-resin insulator
Rated voltage	7.2kV
Electrostatic capacitance	3 × 250pF
Dielectric strength	Class 6A, 22kV AC (1 minute)
Mass (kg)	3.6kg (1set = 3pcs)

Protective Relays

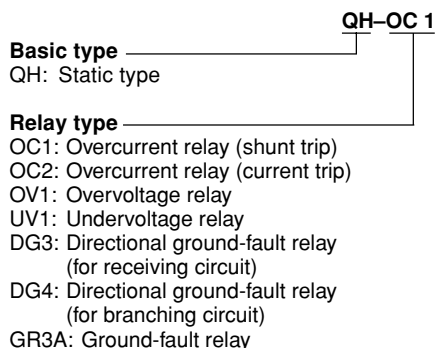
QH series

● Ground-fault relays

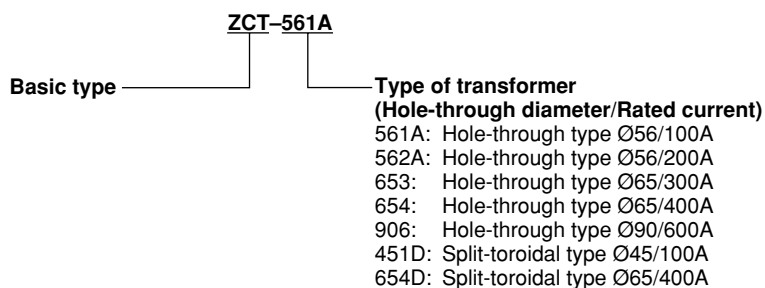
Type	QH-GR3A	
Trip system	Shunt trip, current trip	
Operating current setting	0.1-0.2-0.4-0.6-0.8A	
Operating time	0.1 to 0.3s at 130% current setting value 0.1 to 0.2s at 400% current setting value	
Indication	Operation	Magnetic inversion (manual reset)
	Power	Green LED
Contact	For trips: 2PDT	Making capacity: 10A at 250V AC ($\cos\phi=0.4$), 10A at 125V DC (L/R= 7ms) Breaking capacity: 7.5A at 110V AC (max. 825VA at 250V AC) ($\cos\phi=0.4$) 1.2A at 100V DC (max. 120W at 125V DC) (L/R= 7ms)
	For alarm: 1NO	2A at 110V AC (max. 220VA at 250V AC) 2A at 24V DC (0.1A at 125V DC)
Consumed VA	5VA (at operating)	
Test button	Provided	
Mass	1.7kg	

■ Type number nomenclature

• Protective relays



Zero-phase current transformers



• Zero-phase potential input device



■ Ordering information

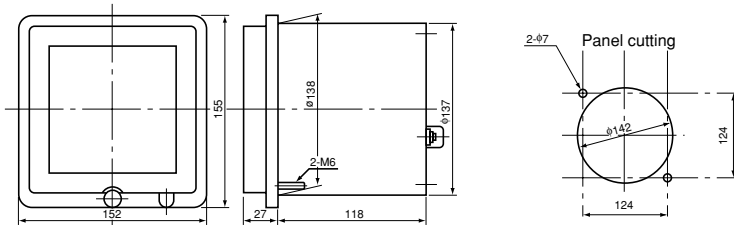
Specify the following:

1. Type number
2. Rated control voltage and frequency
3. Rated current and frequency
(Overcurrent relay)
4. Setting range (Volts or Amperes)

■ Dimensions, mm

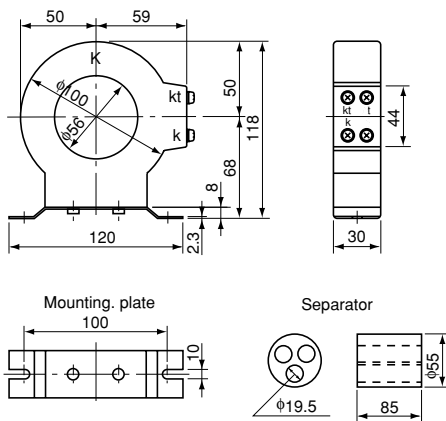
● Relays

QH-OC1, OC2, OV1, UV1, DG3, DG4, GR3A

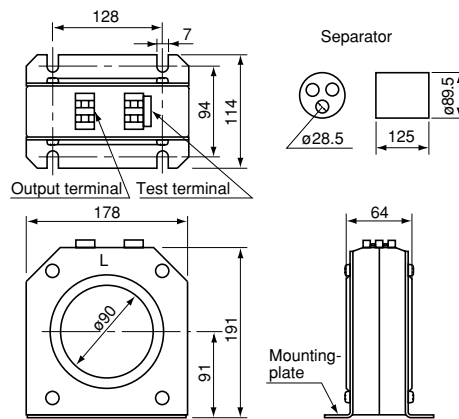


● Zero-phase current transformers

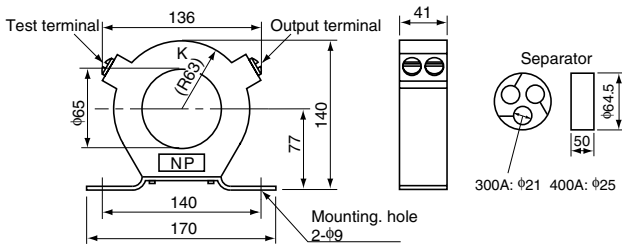
ZCT-561A, 562A



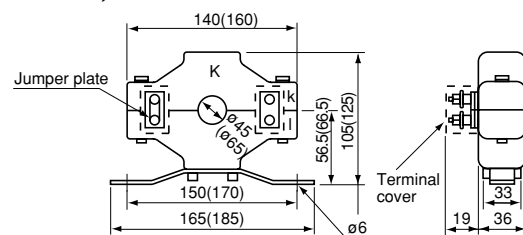
ZCT-906



ZCT-653, 654



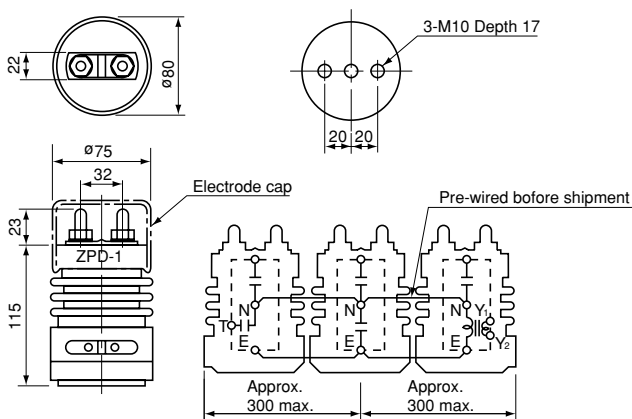
ZCT-451D, 654D



() : for ZCT-654D

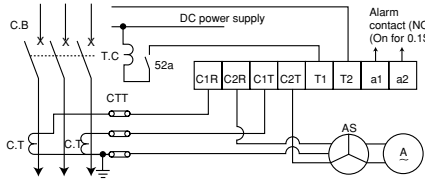
● Zero-phase potential input device

ZPD-1

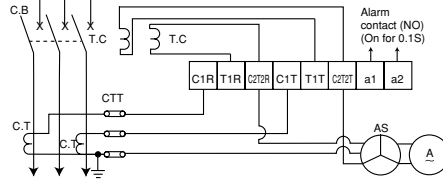


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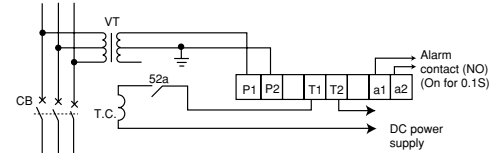
External wiring diagrams QH-OC1



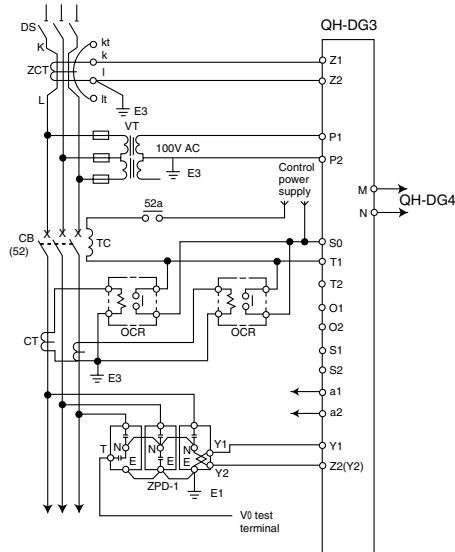
QH-OC2



QH-OV1, QH-UV1

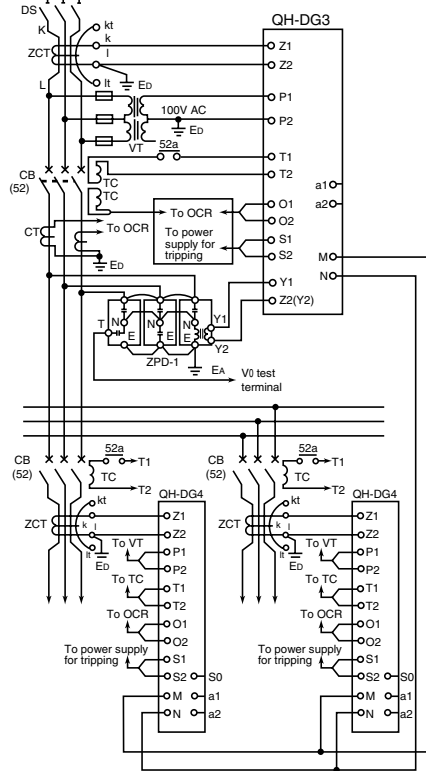


QH-DG3, shunt-trip

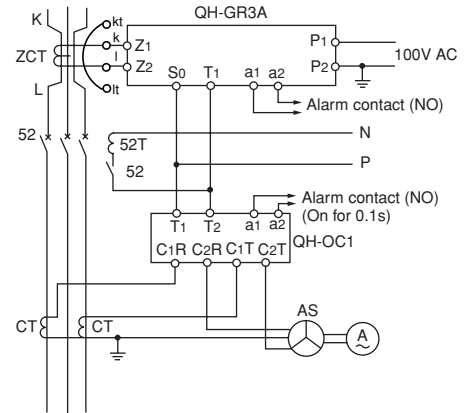


QH-DG3 with QH-DG4

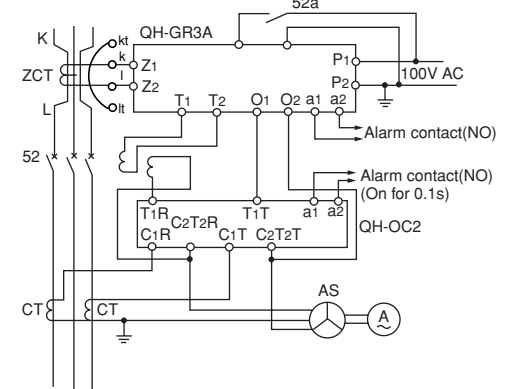
Installation at receiving point and branch point (QH-DG3 at receiving point, QH-DG4 at branch point)



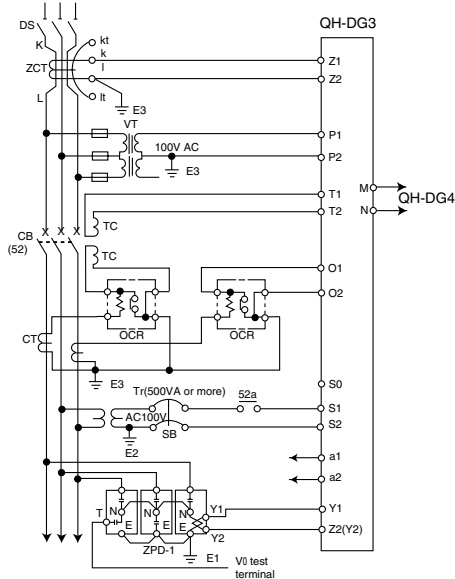
QH-GR3, shunt-trip



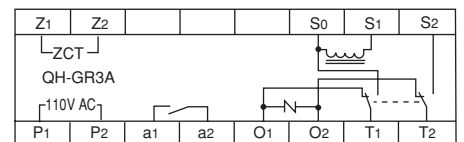
QH-GR3, current trip



QH-DG3, current trip



Internal wiring diagram/QH-GR3



■ Characteristic curves
QH overcurrent relay

