

TGQ1N Series Automatic Transfer Switch



TGQ1N-63



TGQ1N-160



125-800 frame A type
controller



125-800 frame B type
controller



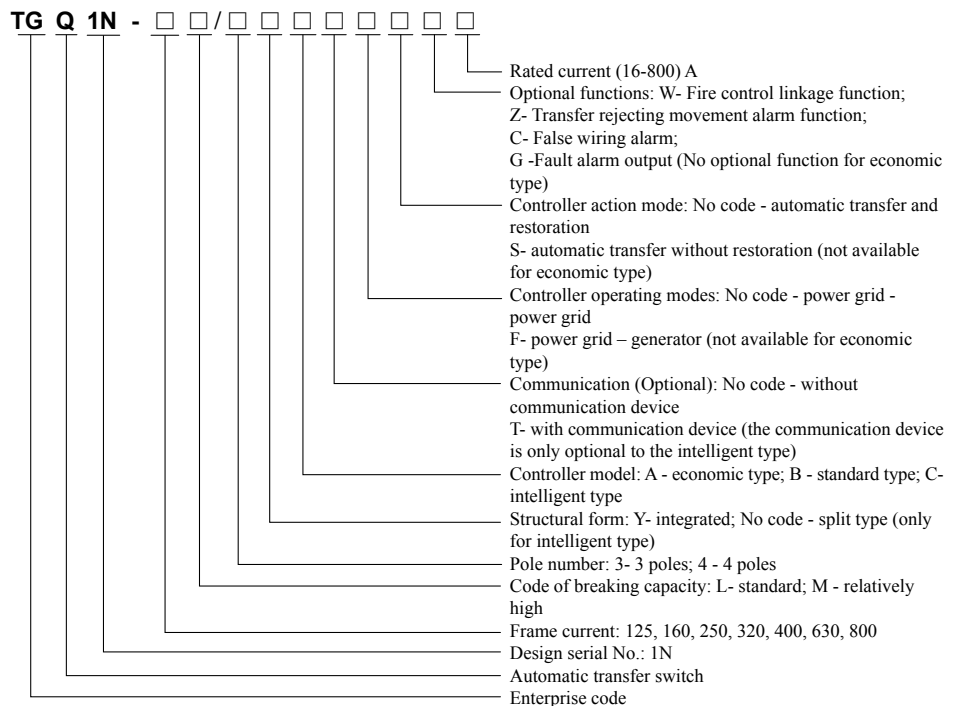
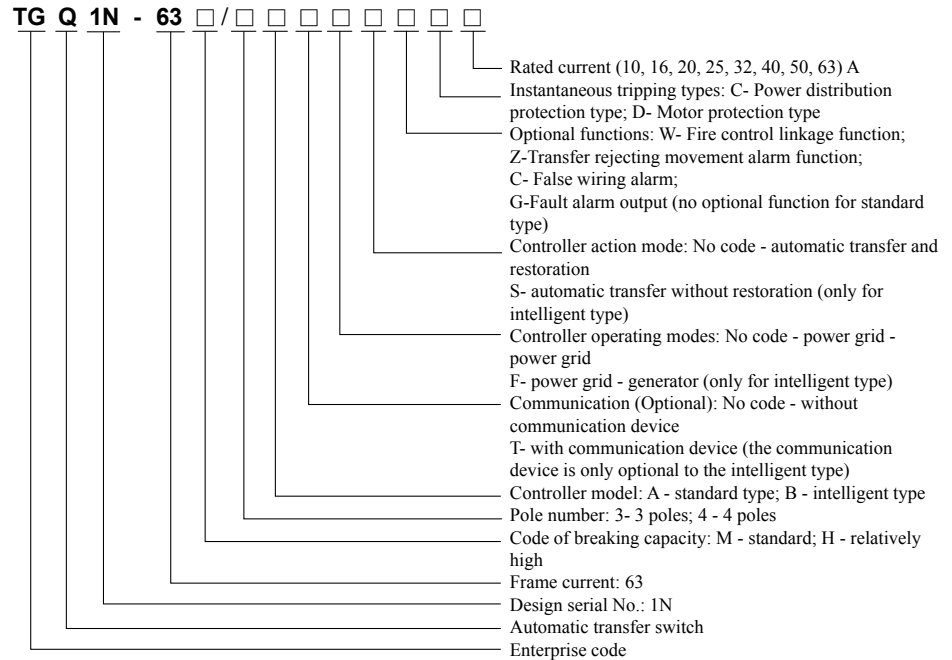
125-800 frame C type
controller

1 Product overview

TGQ1N series automatic transfer switch is suitable for three-phase four-wire dual power supply network with AC current 50Hz, rated working voltage of AC400V, rated working current up to 800A, to automatically connect one or more load circuits from one power supply to another, ensuring the normal power supply of the load circuit. This product is suitable for industrial places, commercial places, residential buildings and other important places.

This product complies with standard IEC 60947-6-1.

2 Type designation



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3 Product parameter

Model	TGQ1N-63		TGQ1N-125			TGQ1N-160		TGQ1N-250、320		TGQ1N-400、630		TGQ1N-800	
Standards	IEC60947-6-1												
Executive circuit breaker	TGB1N-63	TGB3H-63	TGM1N-125			TGM1N-160		TGM1N-250、320		TGM1N-400、630		TGM1N-800	
Current specifications (A)	10、16、20、25、32、40、50、63		16、20、25、32、40、50、63、80、100、125			100、125、140、160		160、180、200、225、250、280、300、315、350		250、315、350、400、500、630		630、700、800	
Rated working voltage (Ue)	AC400V 50Hz												
Rated insulation voltage (Ui)	AC 500V			AC 800V									
Rated impulse withstand voltage (Uimp)	4kV			8kV									
Pole number	3P/4P												
Tripping type	Grades C and D tripper			/									
Code of short-circuit breaking capacity	M	H	L	M	L	M	L	M	L	M	L	M	M
Rated short-circuit making capacity Icm(kA)	9.2	17	52.5	73.5	73.5	105	73.5	105	105	154	105	154	
Rated short-circuit breaking capacity Icn(kA)	6	10	25	35	35	50	35	50	50	70	50	70	
Mechanical life	10000(*)							6000 (*)				4000 (*)	
Electrical life	3000(*)									2000 (*)			
Use category	AC-33iB			AC-33B									
Electrical level	Grade CB												
Protection features	Overload protection / short circuit protection												
Installation mode	Fixed vertical installation												
Wiring mode	Screw wiring												
Operation mode	Manual/automatic/remote operation (with communication device)												
Electromagnetic compatibility	Environment B												
Length of insulation to be removed before insertion of the conductor into the terminal (mm)	11			/									
The maximum number of conductor allowed to be clamped	1									2			
Switch position	Normal (I), power off (O), standby (II)												
Pollution class	2			3									
Screw tightening torque (N·m)	2.5		8		10		12		22		28		
Screw failure moment (N·m)	3		12		15		18		26		33		
Protection level	IP20			IP00									
Conversion time (s)	0.45±50%		1.2±10%		0.9±10%		1±10%		2.8±10%		2.7±10%		
Power-off time (s)	0.45±50%		1.2±10%		0.9±10%		1±10%		2.8±10%		2.7±10%		
Delay time range (s)	Fixed (standard type), 0 - 30s adjustable (intelligent type)		Fixed (economic type), 0 - 30s adjustable (standard type), 0 - 90s continuously adjustable (intelligent type)										
Supply voltage deviation range (V)	160±10%		160±10% (economic type, standard type), 160 - 200 adjustable ±10% (intelligent type)										
Control features	Undervoltage, voltage loss, overvoltage, phase loss transformation												
Controller power consumption (W)	≤5			≤10									
Normal operation scope	85%Ue ~ 110%Ue												
Special requirements	Normal installation conditions												
Isolation function	Yes												

Note: (*) maintainable

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4 Functions of controller

Applicable frame		63		125-800		
Type of controller		A (standard type)	B (intelligent type)	A (Economic type)	B (standard type)	C (intelligent type)
Installation form		Integrated		Integrated	Integrated	Integrated, split type
Rated working voltage		230V/50Hz				
Work location	Closing of normal power supply	■	■	■	■	■
	Closing of standby power supply	■	■	■	■	■
	Opening of dual-way power supply	■	■	■	■	■
Operation mode	Automatic operation	■	■	■	■	■
	Handle operation	■	■	■	■	■
	Controller button operation	—	■	—	■	■
	Remote communication control	—	□	—	—	□
Key operation	Switch to normal	—	—	—	■	■
	Switch to standby	—	—	—	■	■
	Switch double split	—	—	—	■	■
	Test button	—	■	—	■	■
Monitor	Monitoring phase	3-phase for common use, single phase for standby	3-phase	3-phase for common use, single phase for standby	3-phase	3-phase
	Normal undervoltage monitoring	■	■	■	■	■
	Normal overvoltage monitoring	—	■	—	■	■
	Normal voltage loss monitoring	■	■	■	■	■
	Normal loose of phase monitoring	■	■	■	■	■
	Standby undervoltage monitoring	Phase A	■	Phase A	■	■
	Standby overvoltage monitoring	—	■	—	■	■
	Standby voltage loss monitoring	■	■	■	■	■
	Standby loose of phase monitoring	Phase A	■	Phase A	■	■
Conversion mode	Fire-fighting signal power off	—	■	—	■	■
	Automatic change and automatic recovery	■	■	■	■	■
	Mutual backup	—	■	—	■	■
Grid connection	Automatic change without automatic recovery	—	■	—	■	■
	Power grid - power grid	■	■	■	■	■
Grid connection	Power grid - generator	—	□	—	□	□
Display	Screen	Indicator light	Indicator light	Indicator light	Indicator light	Liquid crystal
	Indication of normal power supply	■	■	■	■	■
	Indication of standby power supply	■	■	■	■	■
	Connection and disconnection of the common power supply	■	■	■	■	■
	Connection and disconnection of the standby power supply	■	■	■	■	■
	Voltage values of the common power supply	-	-	-	-	■
	Voltage values of the standby power supply	-	-	-	-	■
	Manual / automatic	■	■	■	■	■
	Display of time delay	-	■(Dial-up indicator)	-	■(Dial-up indicator)	■
	Display of fault alarm	-	■	-	■	■
	Fire control linkage status	-	-	-	-	■
	Generator starting state	-	-	-	-	■
Parameter setting	Adjustable transfer time delay (s)	-	■	-	■	■
	Adjustable return time delay (s)	-	■	-	■	■
	Operating mode switch settings	■	■	■	■	■
	Generator startup time delay	-	-	-	-	□
	Generator shutdown time delay	-	-	-	-	■
	Adjustable undervoltage	-	-	-	-	■
	Adjustable overvoltage	-	-	-	-	■
Other functions	Fire control feedback	-	□(one from four, default)	-	□(one from four, default)	□(one from four, default)
	Fault alarm output	-	□(one from four)	-	□(one from four)	□(one from four)
	Position feedback output	■	■	■	■	■
	Communications function	-	□	-	-	□
	Transfer failure alarm	-	□(one from four)	-	□(one from four)	□(one from four)
	Wrong wiring alarm	-	□(one from four)	-	□(one from four)	□(one from four)

Note:

1. “-” this function is not available; “□” this function is optional; “■” standard function;
2. The one from four function of C type is adjustable. The one from four function of B type can only set when delivery.

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5 Normal working conditions and installation conditions

- 5.1 Ambient air temperature: the ambient air temperature shall be not higher than +40°C but shall not lower than -5°C, with the average temperature within 24h not exceeding +35°C;
- 5.2 Altitude: The altitude of the installation site should be not more than 2,000m;
- 5.3 Atmospheric conditions: the relative humidity of atmosphere shall not exceed 50% at the maximum ambient temperature of +40°C, and a higher relative humidity is allowed at the lower temperature. For example, the relative humidity can reach 90% at +20°C. Special measures shall be taken for occasional condensation due to temperature changes.
- 5.4 Pollution class: The pollution class of 63 frame is Level 2; the pollution class of 125 and above frames is Level 3.
- 5.5 Installation category: IV.
- 5.6 Inclination of installation: The product is fixed and installed in the cabinet, with the maximum inclination of $\pm 22.5^\circ$.

6 Features and functions

TGQ1N series automatic transfer switch (hereinafter referred to as automatic transfer switch) is a new generation of Grade CB products combining advanced digital electronic control technology. It has the characteristics of small size, good-looking appearance, energy-saving, convenient installation and reliable double interlocking protection and advanced and complete functions.

6.1 Small volume,

It adopts single motor driving structure, which achieves transfer through the positive rotation and reverse rotation of the motor, and reduces the product height and installation space.

6.2 Energy-saving

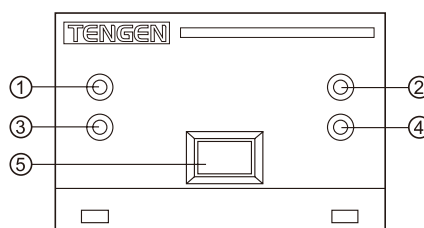
It is driven by motor, with small power consumption and small noise.

6.3 Double interlocking protection

It adopts mechanical interlock and electronic interlock to prevent the synchronous power on of two power supplies.

7 Controller display and operating instructions

7.1 Description of the display interface of 63 frame type A controller



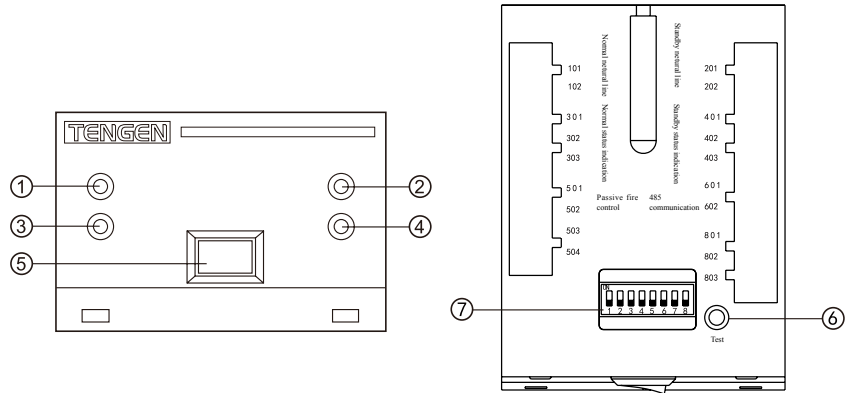
63 frame type A controller

- ① Normal power supply indicator light;
- ② Standby power supply indicator light;
- ③ Normal closing indicator light;
- ④ Standby closing indicator light;
- ⑤ Switchover button between Automatic Mode and Manual Mode.

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7.2 Description of the display interface of 63 frame type B controller

7.2.1 Controller operation introduction

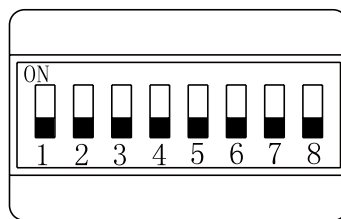


63 frame type B controller

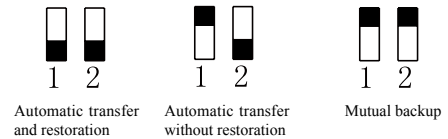
Top dial-up and test keys of products

- ① Normal power supply indicator light (flicker and alarm in case of fault);
- ② Standby power supply indicator light (flicker and alarm in case of fault);
- ③ Normal closing indicator light;
- ④ Standby closing indicator light;
- ⑤ Switchover button between Automatic Mode and Manual Mode (for products with fire control linkage function, press the automatic/manual key to relieve after implementing the fire control linkage function);
- ⑥ Test key: Press the test key, and two power supplies perform a transfer to meet the requirements of field debugging and testing.
- ⑦ Dial-up setting switch.

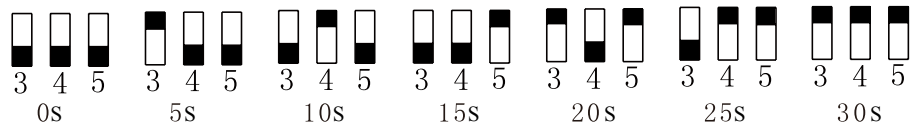
7.2.2 Dial-up setting description



8-digit dial-up switch

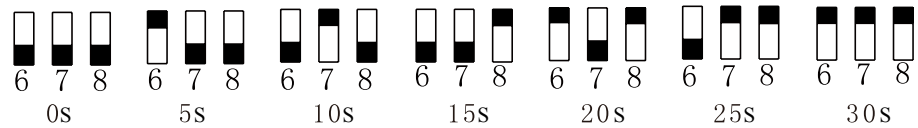


Operating mode setting



Return time delay setting

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Return time delay setting



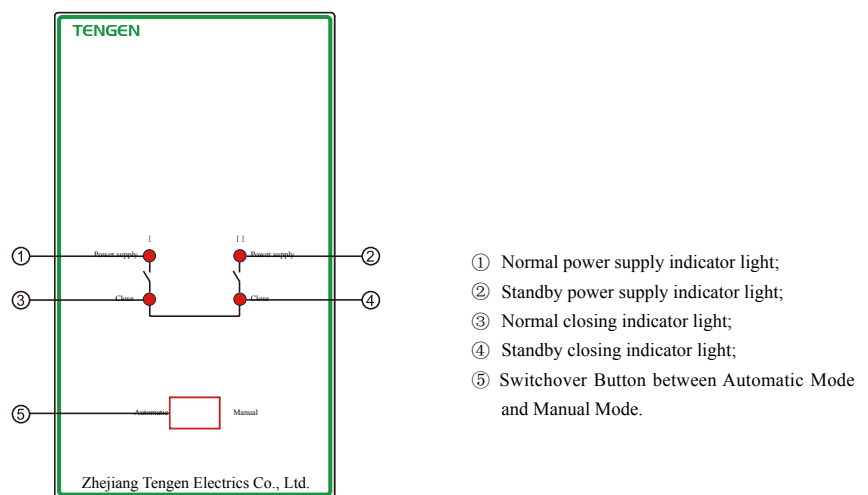
Note:  Switch the dial-up down;  Switch the dial-up up

Table of setting values

Setting item	Dial-up switch								Remarks
	1	2	3	4	5	6	7	8	
Transfer mode setting	0	0	-	-	-	-	-	-	Automatic transfer and restoration
	1	0	-	-	-	-	-	-	Automatic transfer without restoration
	1	1	-	-	-	-	-	-	Mutual backup
Transfer time delay setting	-	-	0	0	0	-	-	-	0s
	-	-	1	0	0	-	-	-	5s
	-	-	0	1	0	-	-	-	10s
	-	-	0	0	1	-	-	-	15s
	-	-	1	0	1	-	-	-	20s
	-	-	0	1	1	-	-	-	25s
Return time delay setting	-	-	1	1	1	-	-	-	30s
	-	-	-	-	-	0	0	0	0s
	-	-	-	-	-	1	0	0	5s
	-	-	-	-	-	0	1	0	10s
	-	-	-	-	-	0	0	1	15s
	-	-	-	-	-	1	0	1	20s
	-	-	-	-	-	0	1	1	25s
	-	-	-	-	-	1	1	1	30s

Note: The sequence of the dial-up switch increases from left to right, with 8 digits in total, pushing to the direction of the dialing code to meet the ON is 1, otherwise it is 0, and the dialing should be completed firmly.

7.3 Description of the display interface of 125-800 frame type, A controller

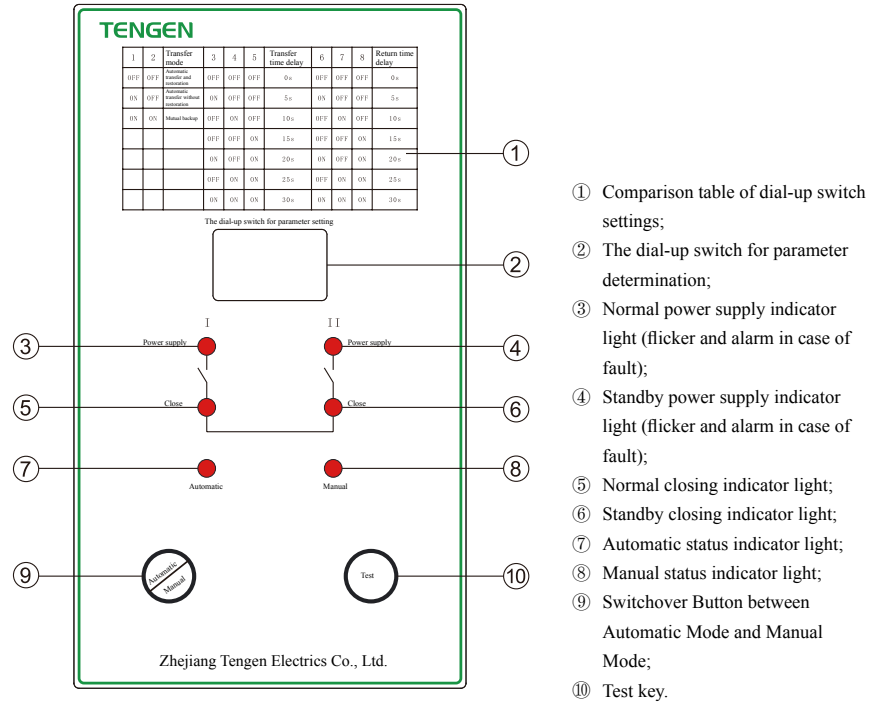


125-800 frame A type controller

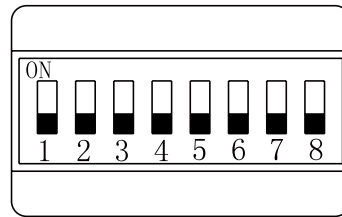
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7.4 Description of the display interface of 125-800 frame type,B controller

7.4.1 Controller operation introduction



7.4.2 Dial-up setting description



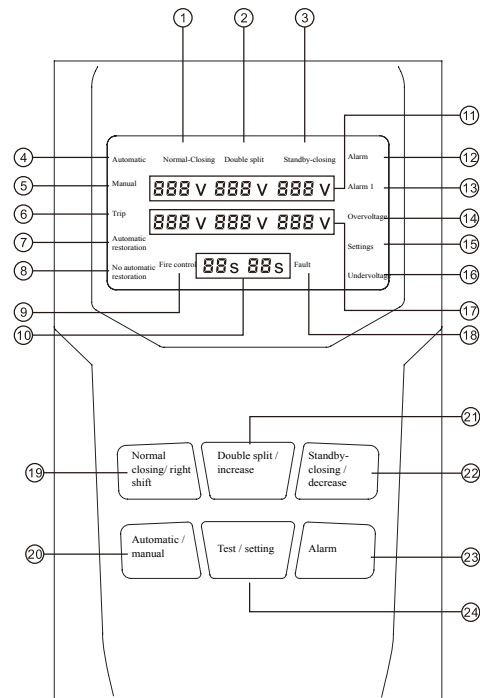
8-digit dial-up switch

The setting way of the dial-up switch is same as 7.2.2

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7.5 Description of the display interface of type C controller

7.5.1 Operating instructions of type C controller



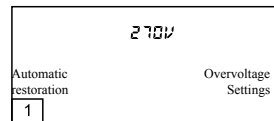
- ① Represent the status of closing for normal power supply;
- ② Represent the status of double split;
- ③ Represent the status of closing for standby power supply;
- ④ Represent that it is in automatic mode;
- ⑤ Represent that it is in manual mode (It can be forcedly transferred with the operating handle or electrically transferred with the key. It needs to be noted that the power supply for the pre-switching power supply side must be normal voltage, otherwise it will not be transferred);
- ⑥ Represent that the product is under overcurrent tripping status;
- ⑦ The transfer mode is automatic transfer and restoration;
- ⑧ The transfer mode is automatic transfer without restoration;
- ⑨ Status after implementing the fire control linkage function;
- ⑩ Display of time delay;
- ⑪ Displaying area of real-time voltage monitoring values A, B and C of the normal power supply;
- ⑫ Alarm indication (when the word "alarm" is displayed (the alarm key can be used to turn on or turn off the "alarm" display status), the phase-to-ground voltage exceeds 300V or null line is connected wrong, or the buzzer alarms in case of switch overcurrent trip fault);
- ⑬ Alarm 1 (a reserved function, which can be used for customization);
- ⑭ Displaying overvoltage status (When it is detected that the power supply terminal voltage exceeds the set threshold value, it displays the word "overvoltage");
- ⑮ Displaying mode setting;
- ⑯ Displaying undervoltage status (When it is detected that the power supply terminal voltage is lower than the set threshold value, it displays "undervoltage");

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- ⑰ Displaying area of real-time voltage monitoring values A, B and C of the standby power supply;
- ⑱ Fault display (fault display when the phase-to-ground voltage exceeds 300V or null line is connected wrong);
- ⑲ Normal-closing/shift composite key (when the normal power supply is normal, press this key to forcibly switch it to the normal power supply; During the mode setting, the key is of parameter right shift function);
- ⑳ Automatic/manual switch composite key;
- ㉑ Double split/ increase composite key (in the manual or automatic mode, press the key to transfer the switch to the power off position; During the mode setting, the parameter is modified to be increasing);
- ㉒ Standby-closing /decrease composite key (when the standby power supply is normal, press this key to forcibly switch it to the standby power supply; During the mode setting, the parameter is modified to be decreasing);
- ㉓ Alarm switch key (press the key to turn on or turn off the alarm function);
- ㉔ Test/set composite key (for test function: When the standby power supply is normal, short press this key to make ATSE transfer from the common power supply to the standby power supply side, vice versa; When setting the functions: Long press this key for 5s, to enter the setup).

7.5.2 Description of setting of C type controller

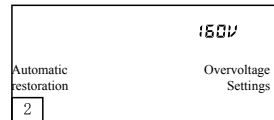
In the standby mode, press “test/set” for over 5s (short press the key to enter the test function) to enter the setting mode.



Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

The default setting value of overvoltage is 270V. The setting range for users is 240-290V.



Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

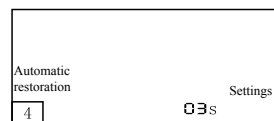
The default setting value of undervoltage is 160V. The setting range for users is 160-200V.



Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

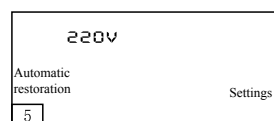
The default setting value of transfer time delay is 0s. The setting range for users is 0-99s



Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

The default setting value of return time delay is 0s. The setting range for users is 0-99s



Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

Calibration of common Phase A voltage

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Calibration of normal Phase B voltage

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.



Calibration of normal Phase C voltage

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

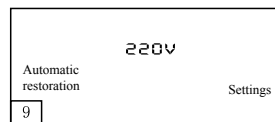
Press “Normal-closing/ right shift” key to set next parameter.



Calibration of standby Phase A voltage

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

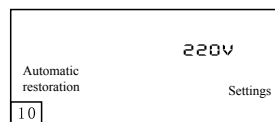
Press “Normal-closing/ right shift” key to set next parameter.



Calibration of standby Phase B voltage

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

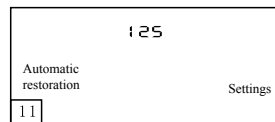
Press “Normal-closing/ right shift” key to set next parameter.



Calibration of standby Phase C voltage

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

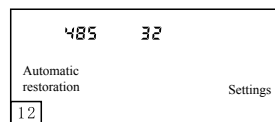
Press “Normal-closing/ right shift” key to set next parameter.



Frame setting (settable parameters include: 125, 250, 400, 630, 800; no adjustment of this item is required by the user).

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

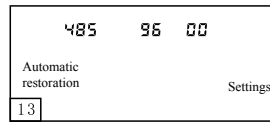


485 communication address setting

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.

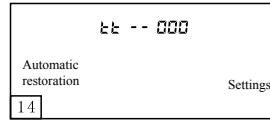
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485 communication baud rate setting

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

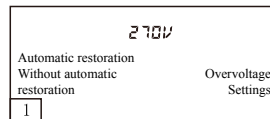
Press “Normal-closing/ right shift” key to set next parameter.



Signal output function setting: “tt--000” fire control feedback output; “tt--001” transfer failure output; “tt--002” wrong wiring output; “tt--003” failure output.

Press “Double split/ increase” key to increase and press “Standby-closing / decrease” key to decrease.

Press “Normal-closing/ right shift” key to set next parameter.



Automatic restoration/without automatic restoration setting

Press “double split/increase” key for increase when “no automatic recovery” is displayed on the screen.

Press “normal-closing/right shift” key step by step, save and exit parameters until all parameters are pressed.

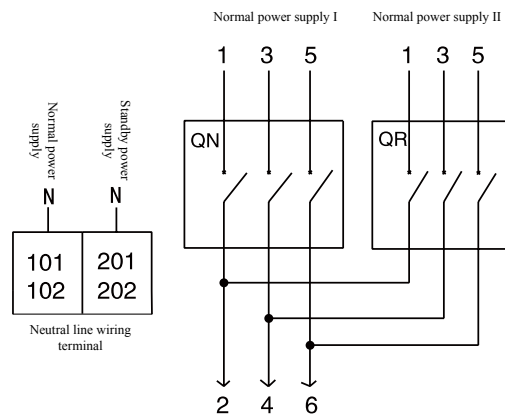
Remarks:

1. If factory default settings need to be recovered, press automatic/manual key for 5s to recover factory default settings (after recovering factory default settings, please recalibrate the normal and standby voltages and reset the frame parameters).
2. When setting the automatic recovery/no automatic recovery: It can set any item of parameters 1-14. The overvoltage setting parameter is taken as an example here. (When automatic restoration or without automatic restoration is displayed, press “right shift/normal-closing” key for confirmation. If no “automatic restoration/without automatic restoration” is displayed, the system is of without automatic restoration function by default).

8 Installation and use

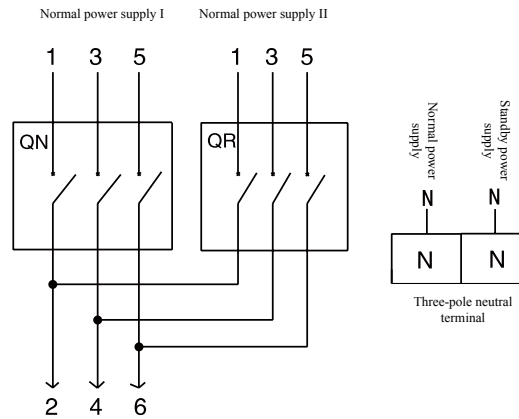
8.1 Wiring diagram of the main circuit of the 3P products (power phase sequence must be consistent)

8.1.1 63 frame, 3P

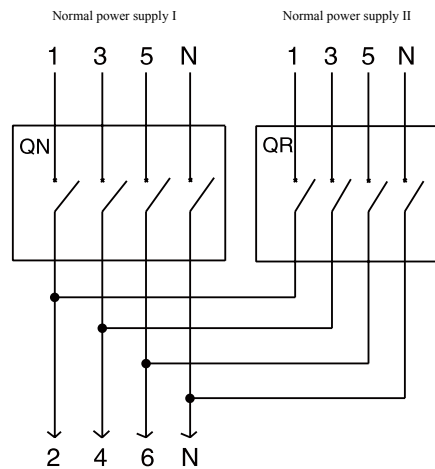


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8.1.2 125-800 frame, 3P



8.2 Wiring diagram of the main circuit of the 4P product (power phase sequence must be consistent)

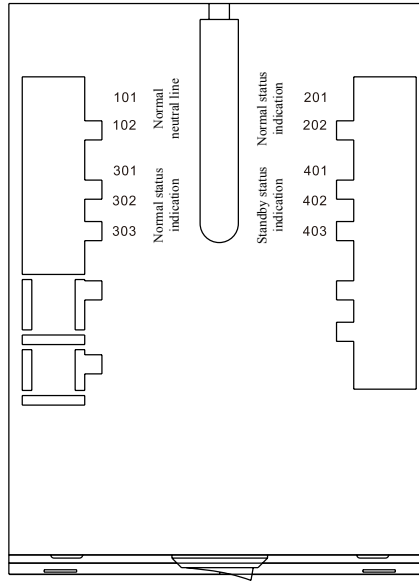


Note: QN is the executive circuit breaker at the normal power supply; QR the executive circuit breaker at the standby power supply.

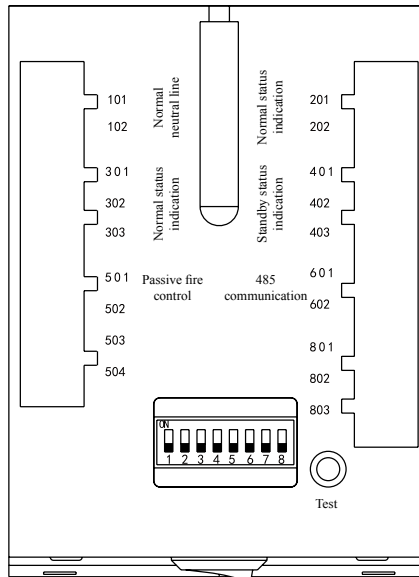
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8.3 Secondary wiring diagram of the controller

8.3.1 Secondary wiring diagram of 63 frame controller

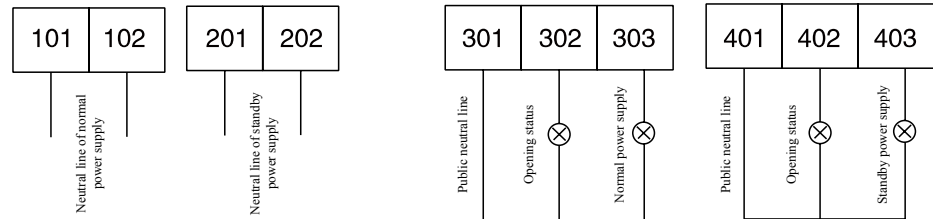


Standard controller



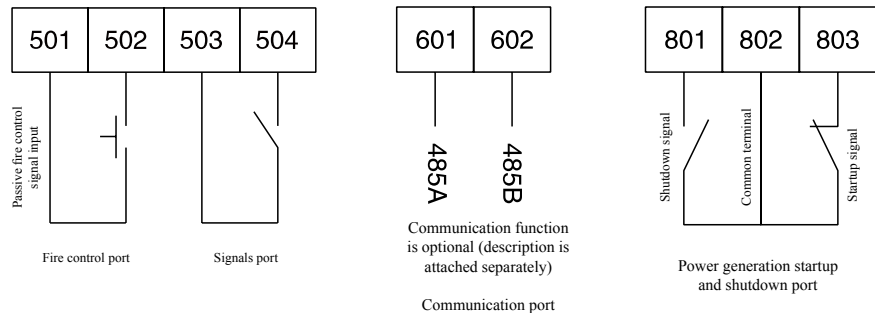
Intelligent controller

TGQ1N Series Automatic Transfer Switch



The terminal of the 3P production which is connected to the neutral line

Output active AC230V/1.5A
Status indication of external signal terminals of the controller



Communication function is optional (description is attached separately)

Communication port

Power generation startup and shutdown port

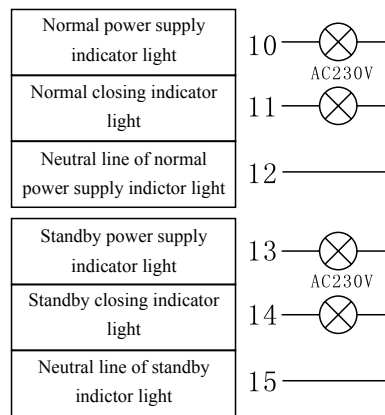
Port wiring instructions:

1. 101, 102, 201 and 202 only need to be connected for 3P products. Please connect the neutral line of the normal power supply to 101 or 102 (or both); Please connect the neutral line of the standby power supply to 201 or 202 (or both). The product will not operate if a three-pole product is not connected to the operating neutral line (not required for 4-pole products).
2. 501, 502 passive fire control signal input (note: After the fire control linkage is started, the control mode will be locked. It can be unlocked by pressing automatic/manual button).
3. 503 and 504 are optional, one from four (see the function table of the controller for details, a set of dry contact signal output. For products with a communication device, the output options shall be set according to the host computer. For products without a communication device, one function shall be fixed in the procedure according to the requirements of customers).
4. 601 and 602 are communication port input. 601 is 485+ (485A); 602 is 485- (485B). Make sure that all polarities are connected correctly; otherwise, the communication will fail.
5. 801, 802 and 803 are power generation startup and shutdown signal output. 802 is COM end; 803 is generator startup signal; 801 is generator shutdown signal.

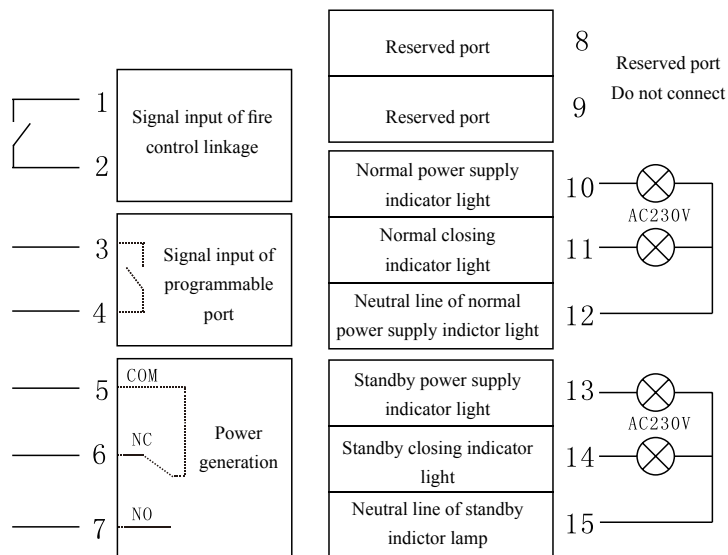
Remarks: 501, 502, 503, 504; 601, 602, 801, 802 and 803 are available only when "intelligent type" products are selected by you.

TGQ1N Series Automatic Transfer Switch

8.3.2 Secondary wiring diagram of 125-800 frame controller

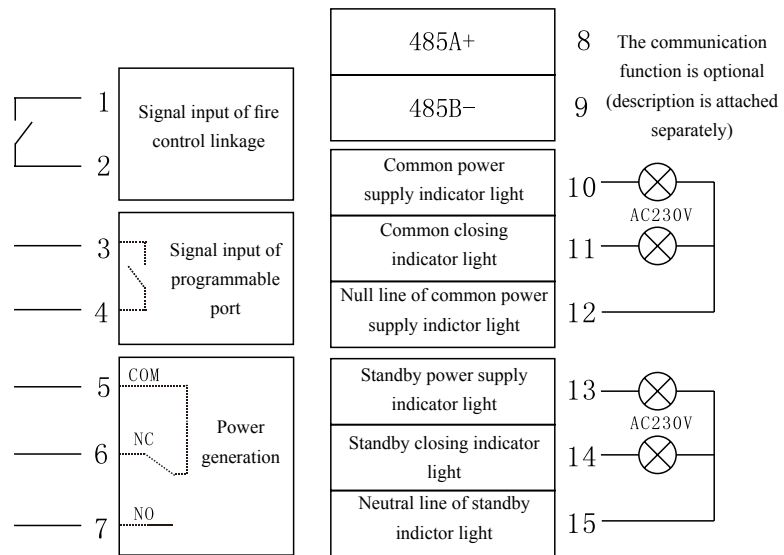


Secondary wiring diagram of the economic controller



Secondary wiring diagram of the standard controller

TGQ1N Series Automatic Transfer Switch

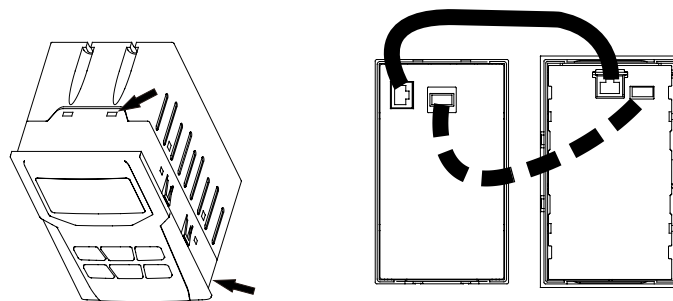


Secondary wiring diagram of the intelligent controller

Remarks:

1. Fire control linkage signal outputs (1, 2) are "passive pulse, short-circuit signal" by default (it only needs to be triggered, and can be short-circuit for a long time). Do not connect them with active power supply during operation; otherwise, the fire control linkage function may be lost. When active DC24V signal needs to be connected to, please consult with the manufacturer for customizing.
2. The generator startup signals (5, 6, 7) can only be used in the power grid – power generation mode. The generator can be connected as needed. In case of fault of the normal power supply, 5 (COM) and 6 (NC) are connected. When the normal power supply is normal, 5 (COM) and 7 (NO) are connected.
3. For programmable signal outputs (3, 4), the output of a function signal shall be determined according to the one from four function (see the function table of the controller for details).
4. 485 communication ports (8, 9) are optional. Please note that, make sure that all polarities are connected correctly during wiring.
5. The output of normal status signals (10, 11, 12) and standby status signals (13, 14, 15) is active AC-230V. Do not connect it with voltage signal; otherwise, it will be short-circuiting with the internal power supply.

9 Description of split assembly of 125-800 frame intelligent controller

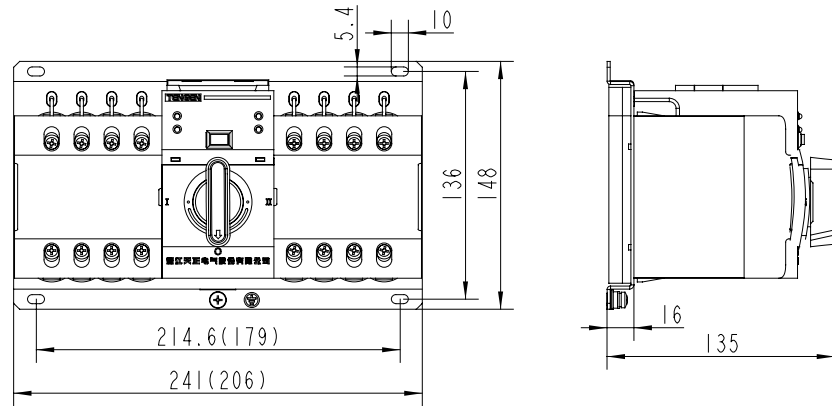


Remarks: For intelligent split-type controller, please slightly lever four places on the display module of the controller with a slot type screwdriver according to the direction shown in the figure, to remove the clip, take out the display module, remove and discard the cable (at the dotted line place), connect them with the network cable (standard when ordering, as shown at the full line) special for the split type, and then install the display on the cabinet gate.

TGQ1N Series Automatic Transfer Switch

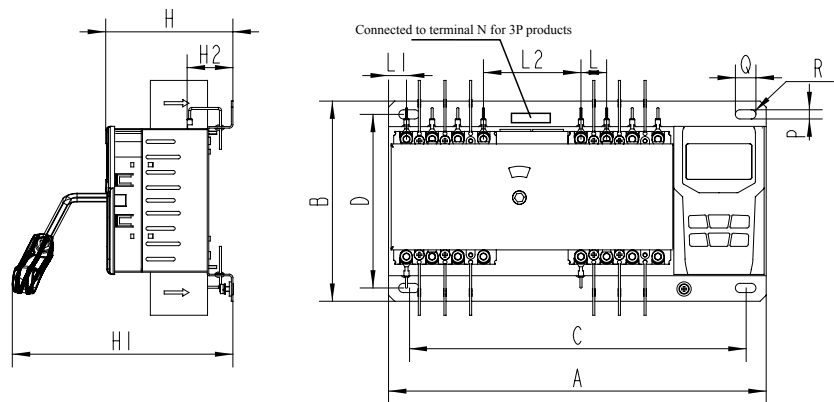
10 Installation and use

10.1 63 frame outline and installation dimension



Note: Dimensions in brackets are that of the three-pole product

10.2 125-800 frame outline and installation dimension

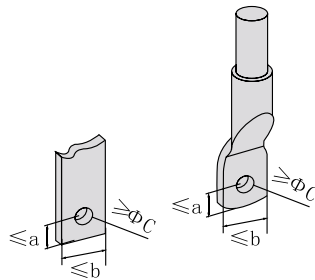


Remarks: The operation handle is usually removed, and is operated in case of emergency operation or manual debugging. Same for the installation dimension of the intelligent split type products.

Specification / dimension	A		B	C		D	H		H1		H2	L	L1	L2		P	Q
	3P	4P		3P	4P		L	M	L	M				3P	4P		
TGQ1N-125	340	368	196	300	328	170	120	120	200	200	25	25	15.5	120	95	9	20
TGQ1N-160	380	410	210	335	365	190	133	149	210	229	25	30	25.5	134	104	9	20
TGQ1N-250 ~ 320	425	460	225	385	420	205	135	152	205	222	25	35	21.5	151	116	9	20
TGQ1N-400 ~ 630	552	600	325	492	540	300	183	183	253	253	25	48	31	210.5	162	11	20
TGQ1N-800	720	790	350	660	730	320	186	186	256	256	25	70	41	270	200	11	20

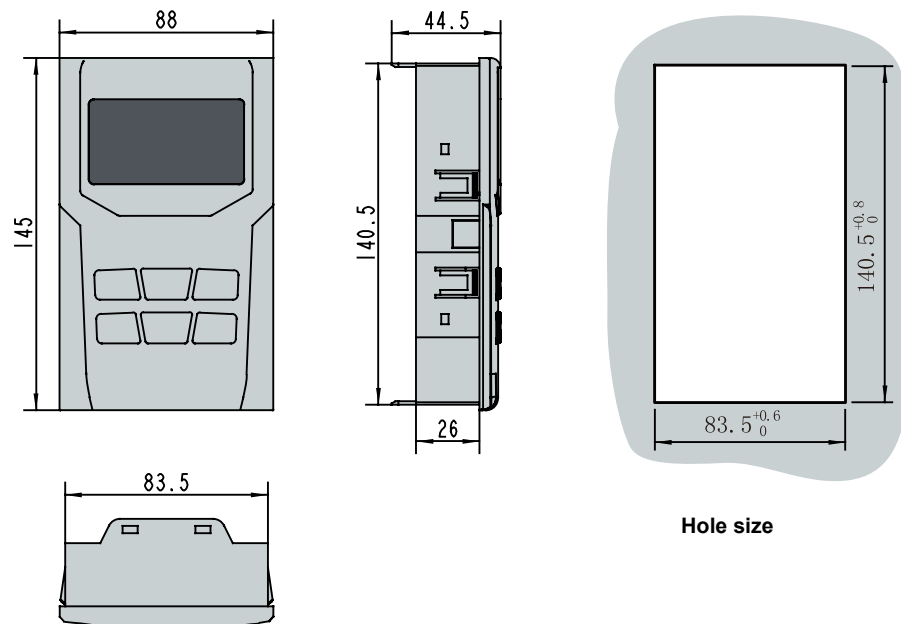
TGQ1N Series Automatic Transfer Switch

10.3 Wiring instructions of 125-800 frame



Model	a	b	c
TGQ1N-125	7.5	17	8
TGQ1N-160	8.5	18	8
TGQ1N-250 ~ 320	10	24	8
TGQ1N-400 ~ 630	17	32	10
TGQ1N-800	19	45	12

10.4 Outline dimension and hole size of 125-800 frame intelligent split controller



Hole size

11 Ordering instructions

Please provide the following details when ordering:

1. Please specify the required model, current, pole number and other information when ordering.
2. For special installation conditions or operation requirements for special places, a user shall provide corresponding technical materials or negotiate with us.

For example: Order 50 sets of automatic transfer switch with frame current of 125A, breaking capacity of L, 4-pole, split-type, intelligent controller, power grid – power grid, automatic transfer and restoration and rated current of 100A.

Fill in: TGQ1N-125L/4C100A 50 sets.