

CORROSION-PROOF TYPE CONTROL SWITCHES



TOGAMI ELECTRIC MFG.CO.,LTD.

Specification

Water-and Corrosion-Proof Control Switch (Please refer to p.2 to 11.)

Type	PBT Type
Installation Method	Wall mounting type Pillar type
Material of Case	Premixed resin
Accessories	Push-button, indicating lamp, change-over switch and ammeter

Corrosion-Proof Magnetic Motor Starter (Please refer to p.12.)

Type	PAMG Type
Installation Method	Wall mounting type
Material of Case	Steel plate
Accessories	Push-button, indicating lamp, change-over switch and ammeter
Maximum applicable load	200 to 220V...40kW; 380 to 440V...75kW

Note: When installing this switch outdoors, it is safer to install it under a roof for preventing rain drops. (A drip-proof cover is optional.)

Corrosion-Proof Combination Starter (Please refer to p.13 to 14.)

Type	GAMG type
Installation Method	Wall mounting type
Material of Case	Steel plate
Accessories	Push-button, breaker operation handle, indicating lamp, change-over switch and ammeter
Maximum applicable load	200 to 220V...40kW; 380 to 440V...75kW

Note: When installing this switch outdoors, it is safer to install it under a roof for preventing rain drops. (A drip-proof cover is optional.)



PBT Type
(Wall mounting type)



PBT Type
(Pillar type)



PAMG Type



GAMG Type

Water-and Corrosion-Proof Type Switch

■ Features

1 Adoption of Overall-Surface Packing Method

For the rubber packing between case and cover, the overall-surface packing method is adopted; hence perfect airtightness is maintained, and even in the case of repeated tension due to push-button operations, no deterioration will occur.

2 Material having Excellent Corrosion-Proofing are Adopted

The case cover is made of premixed resin, which has outstanding corrosion-proofing as compared with ordinary steel or cast-iron plates. Further, since stainless steel is used for cover-fixing screws and padlock-locking plate, there is no need to worry about corrosion.

3 Padlock-locking Plate Device is Used for All Types of Switches as a Standard Device

For the OFF push-button, the locking unit using a padlock plate is a standard type; hence by padlocking, it is conformed to Article 107 (2) of the Labor Safety and Hygiene Regulation.

4 Wide Ammeter Window

The ammeter window is made as wide as the scale width of the ammeter to facilitate reading of the ammeter. (For the ammeter, a red pointer is equipped.)

5 Large and Easy-to-Operate Push-button

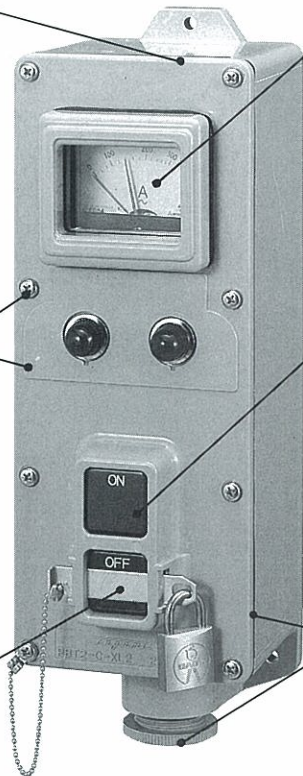
Through the adoption of a large push-button, operation can be made correctly even with a gloved hand.

6 Perfect Airtightness

The cable lead-in port has been made into a tapered tightening system (packing system), and further, the overall-surface packing method is used; hence perfect airtightness can be maintained.

※The grade of airtightness is conformed to IP65 (IEC-144).

※In the airtightness test, the test using air pressurizing at 0.2kgf/cm² is satisfied.



PBT Series has the padlocking plate as a standard device for locking ; hence it is conformed to Article 107 (2) of the Labor Safety and Hygiene Regulation.



Article 107 (2) of Labor Safety and Hygiene Regulation

(quoted from Japanese Labor Safety and Hygiene Regulation)

The enterpriser shall, when he has stopped machine operation according to the provision of the preceding paragraph, padlock the starter of the said machine, thereby taking a measure for preventing anyone other than the machine operator from operating the said machine.



Use

This switch is most suitable for plants which require water-and corrosion-proofing or which have a great deal of dust and require tightly-closed containers.

Standard Specifications & Ratings

Item		Specifications
Rated voltage		250V
Rated current		5A
Ammeter		60mm square, 2.5class, □/5A or □/1A, 3-times extension scale and w/red pointer
Indicating lamp		Neon lamps (RL, GL, OL, and WL); AC100•200V and DC100•200V
Change-over switch		220V, 6A, 25φ; 2-notch and 3-notch
Cable leading-in method		Dust-proof packing type (Threaded joint steel conduit leading type* is also available)
Locking unit		Attached only to the OFF button (Padlocking plate method; the padlock is to be provided by the customer.)
Installation method		Wall mounting type/Pillar type
Material	Case cover	Premixed resin (RL311-BG21); outside color: Munsefll No.7.5BG6/1.5 (approximate color)
	Water-proof packing	Ethylene propylene rubber (EPDM black)
	Push-button	Phenol resin ON (red) and OFF (green)
	Indicating lamp	Globe: Acryl resin; case: Heat-proof resin (black)
	Change-over switch	ABS resin (black)
	Ammeter	Cover: Acryl resin (transparent); case: Phenol resin (black); Frame color: (black)
	Standing pillar	Steel pipe
	Standing base	Cast iron

*Note): Securely fit the conduit and main body; otherwise, the leading port may be broken.

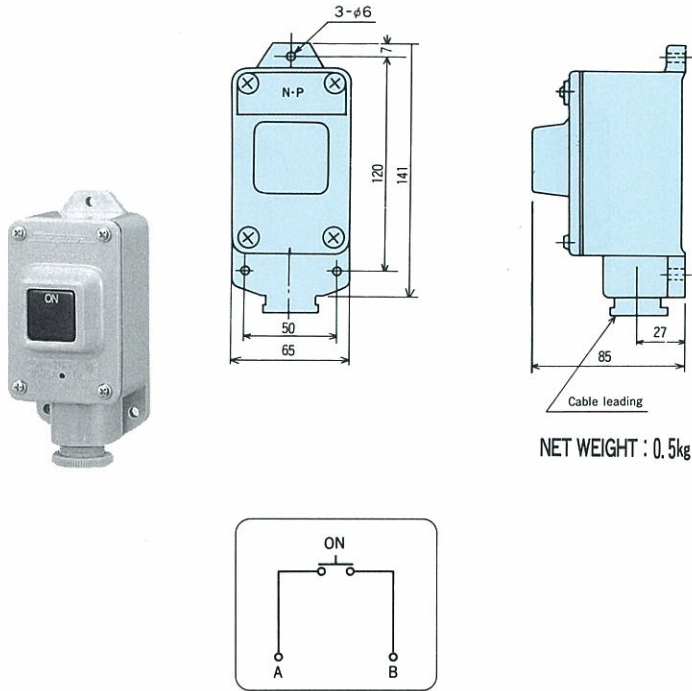
List of Accessories

Outline Drawing No.	Model No.	Setting-up Method	Accessories				Leading Port for Dust-Proof Packing System		Conduit Size
			Push-button	Ammeter	Indicating Lamp	Select Switch	Packing I.D.	Cable O.D.	
1	PBT1-C(ON)	Wall mounting type	ON	—	—	—	φ17	φ10~φ16	PF3/4"
2	PBT1-C-P(ON)	Pillar type							
3	PBT1-C(OFF)	Wall mounting type	OFF	—	—	—	"	"	"
4	PBT1-C-P(OFF)	Pillar type							
5	PBT2-C	Wall mounting type	ON-OFF	—	—	—	"	"	"
6	PBT2-C-P	Pillar type							
7	PBT3-C	Wall mounting type	FOR-REV-OFF	—	—	—	"	"	"
8	PBT3-C-P	Pillar type							
9	PBT2-C-A	Wall mounting type	ON-OFF	○	—	—	"	"	"
10	PBT2-C-A-P	Pillar type							
11	PBT2-C-L	Wall mounting type	ON-OFF	—	2pcs.	—	"	"	"
12	PBT2-C-L-P	Pillar type							
13	PBT2-C-L1	Wall mounting type	ON-OFF	—	1pc.	—	"	"	"
14	PBT2-L1-P	Pillar type							
15	PBT2-C-LG	Wall mounting type	ON-OFF	—	—	○	"	"	"
16	PBT2-C-LG-P	Pillar type							
17	PBT2-C-GL1	Wall mounting type	ON-OFF	—	1pc.	○	φ20	φ15~φ19	PF1"
18	PBT2-C-GL1-P	Pillar type							
19	PBT2-C-GL2	Wall mounting type	ON-OFF	—	2pcs.	○	"	"	"
20	PBT2-C-GL2-P	Pillar type							
21	PBT2-C-XL1	Wall mounting type	ON-OFF	○	1pc.	—	"	"	"
22	PBT2-C-XL1-P	Pillar type							
23	PBT2-C-XL2	Wall mounting type	ON-OFF	○	2pcs.	—	"	"	"
24	PBT2-C-XL2-P	Pillar type							
25	PBT2-C-XG	Wall mounting type	ON-OFF	○	—	○	"	"	"
26	PBT2-C-XG-P	Pillar type							
27	PBT2-C-X	Wall mounting type	ON-OFF	○	2pcs.	○	"	"	"
28	PBT2-C-X-P	Pillar type							

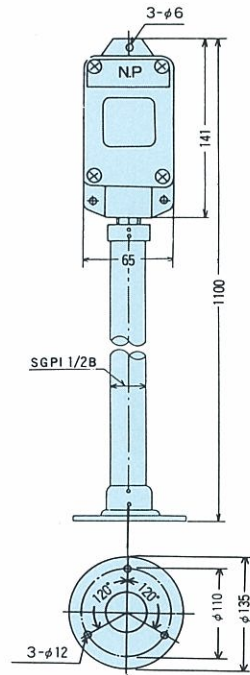
Dimensions & Wiring Diagrams

※ Wiring diagrams are common to
Wall mounting type
and Pillar type

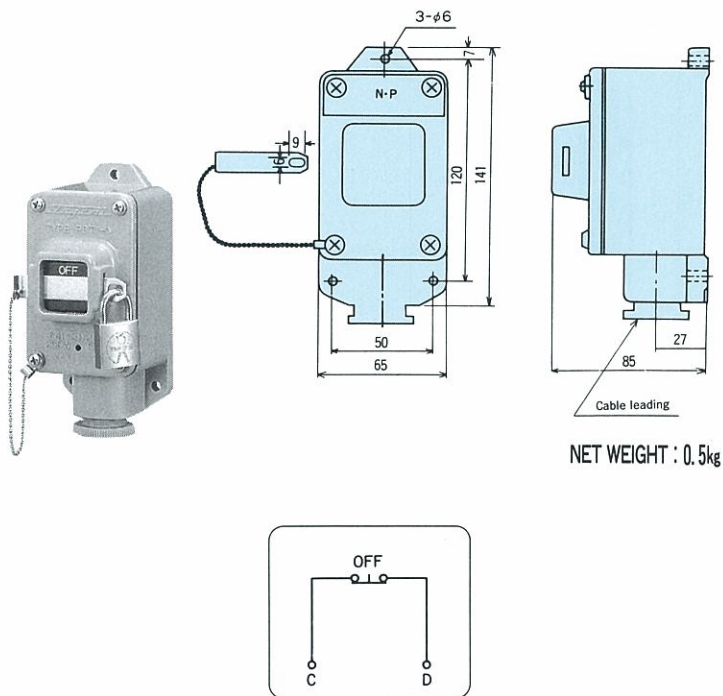
Outside drawing No. 1 PBT1-C(ON)



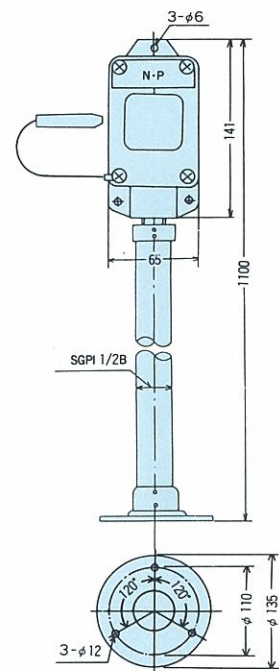
Outside drawing No. 2 PBT1-C-P(ON)



Outside drawing No. 3 PBT1-C(OFF)



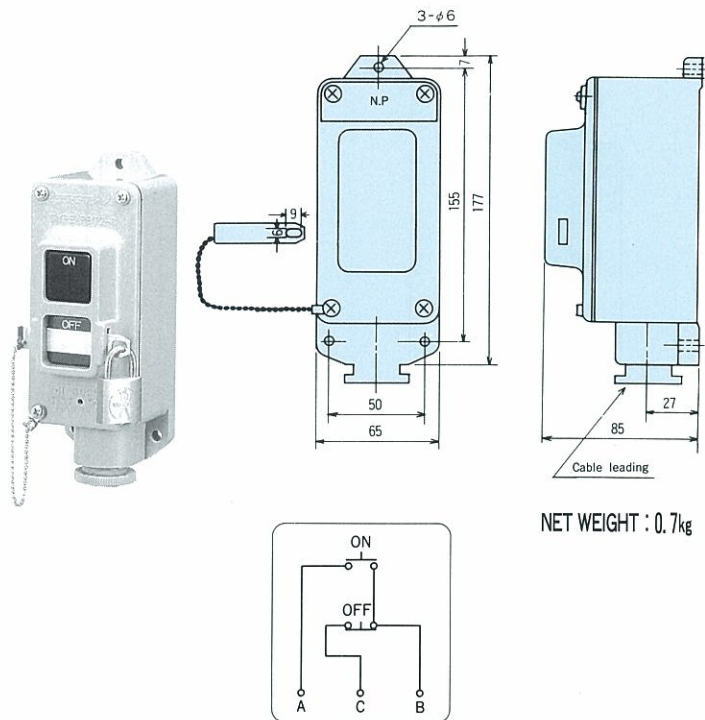
Outside drawing No. 4 PBT1-C-P(OFF)



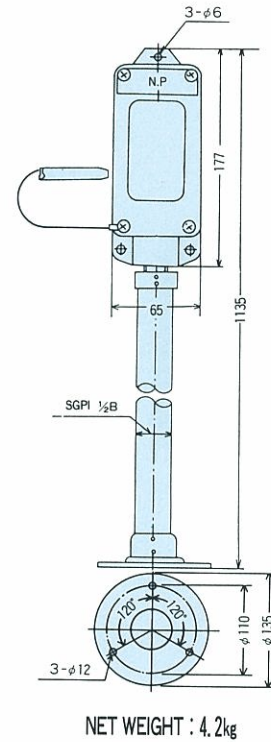
Dimensions & Wiring Diagrams

※ Wiring diagrams are common to Wall mounting type and Pillar type

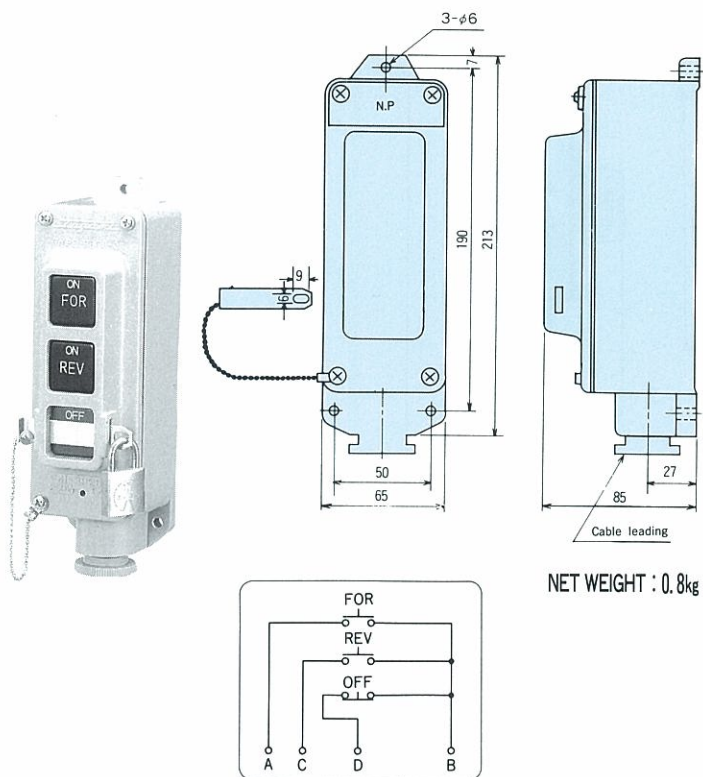
Outside drawing No.5 PBT2-C



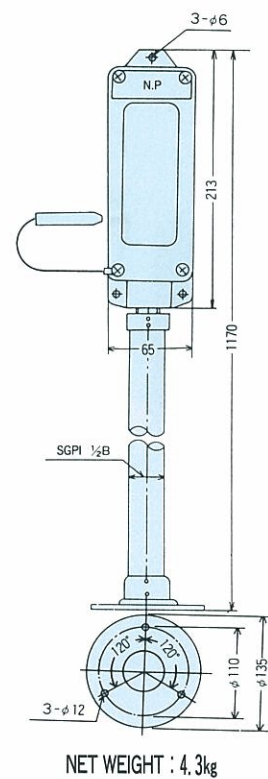
Outside drawing No.6 PBT2-C-P



Outside drawing No.7 PBT3-C



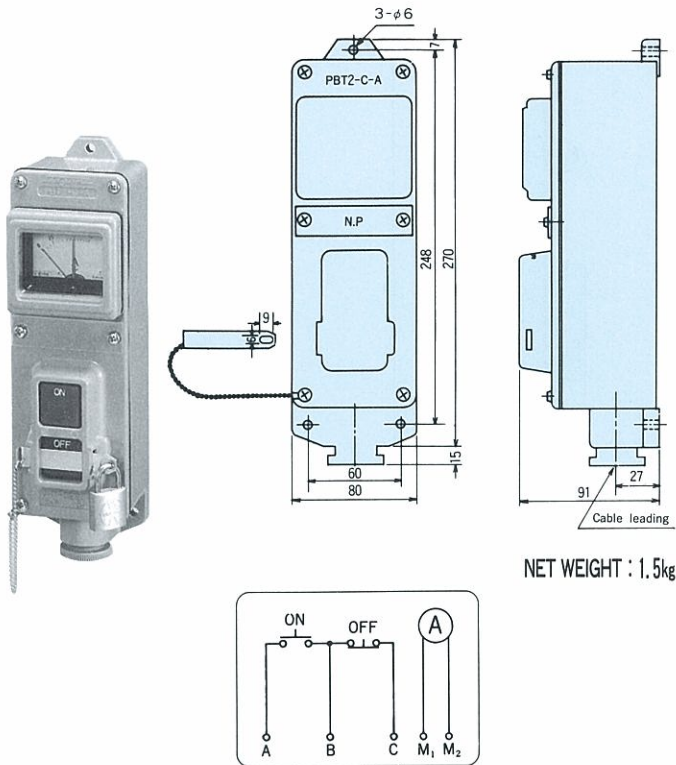
Outside drawing No.8 PBT3-C-P



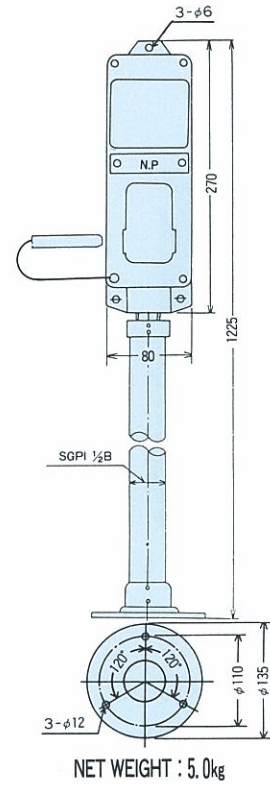
Dimensions & Wiring Diagrams

※ Wiring diagrams are common to
Wall mounting type
and Pillar type

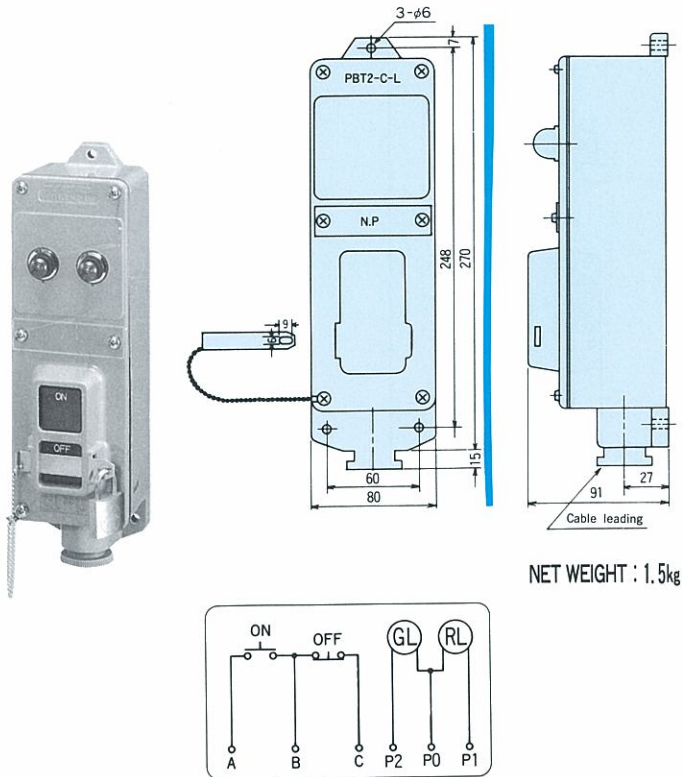
Outside drawing No.9 PBT2-C-A



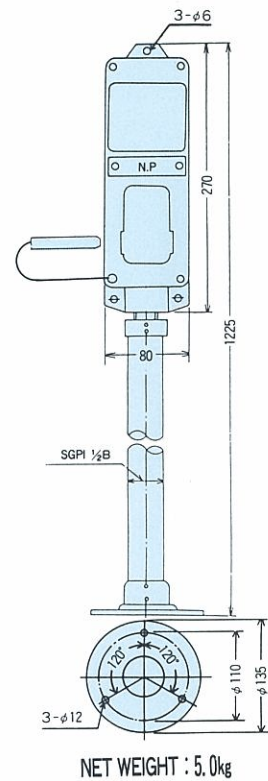
Outside drawing No.10 PBT2-C-A-P



Outside drawing No.11 PBT2-C-L



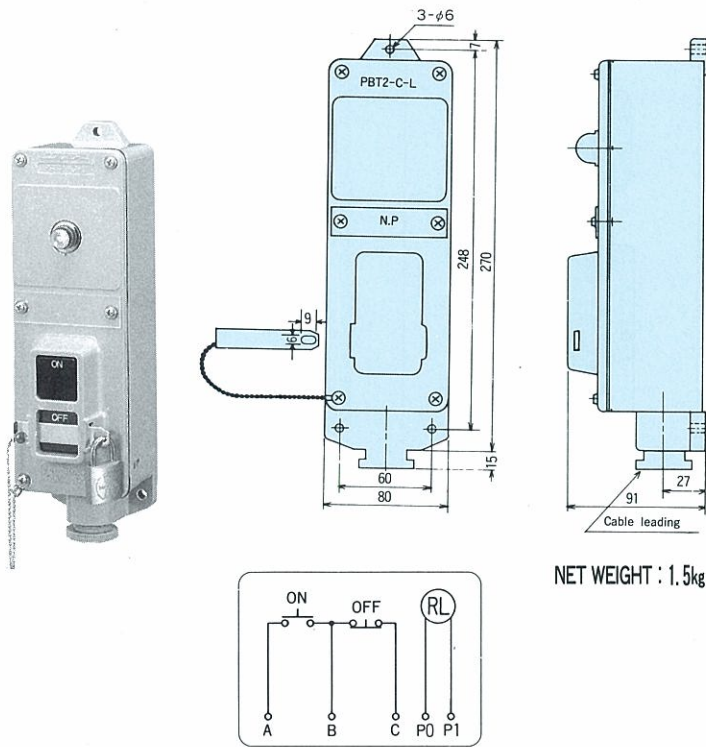
Outside drawing No.12 PBT2-C-L-P



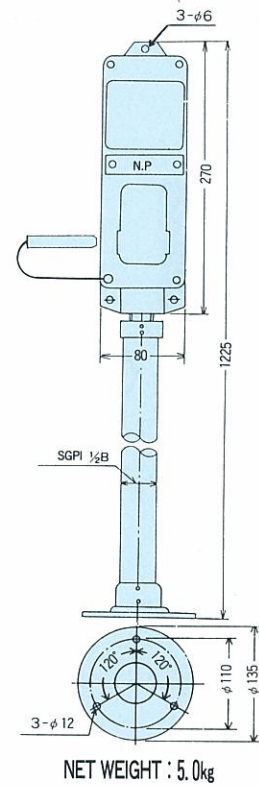
Dimensions & Wiring Diagrams

※ Wiring diagrams are common to Wall mounting type and Pillar type

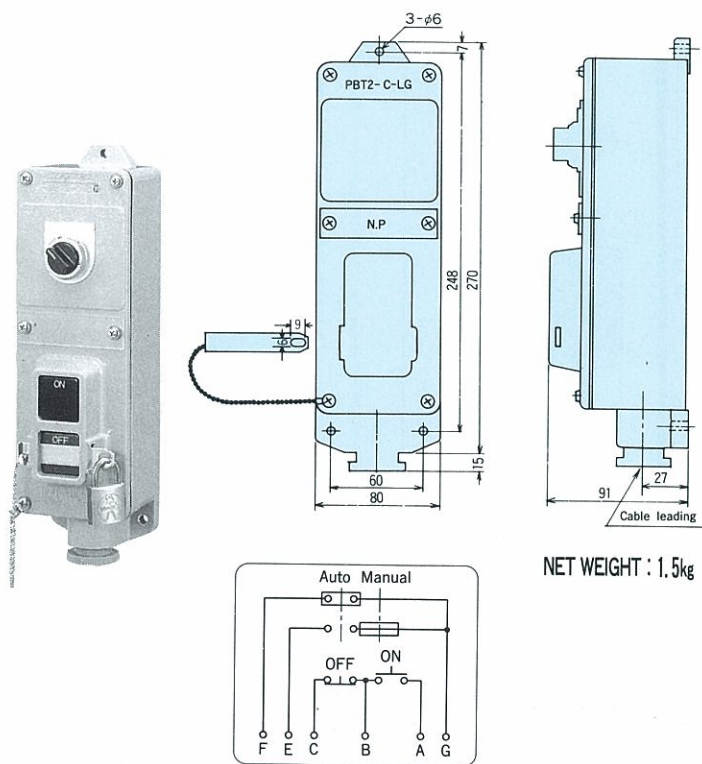
Outside drawing No.13 PBT2-C-L1



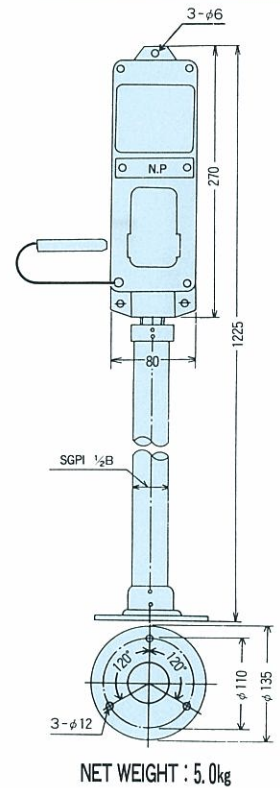
Outside drawing No.14 PBT2-C-L1-P



Outside drawing No.15 PBT2-C-LG



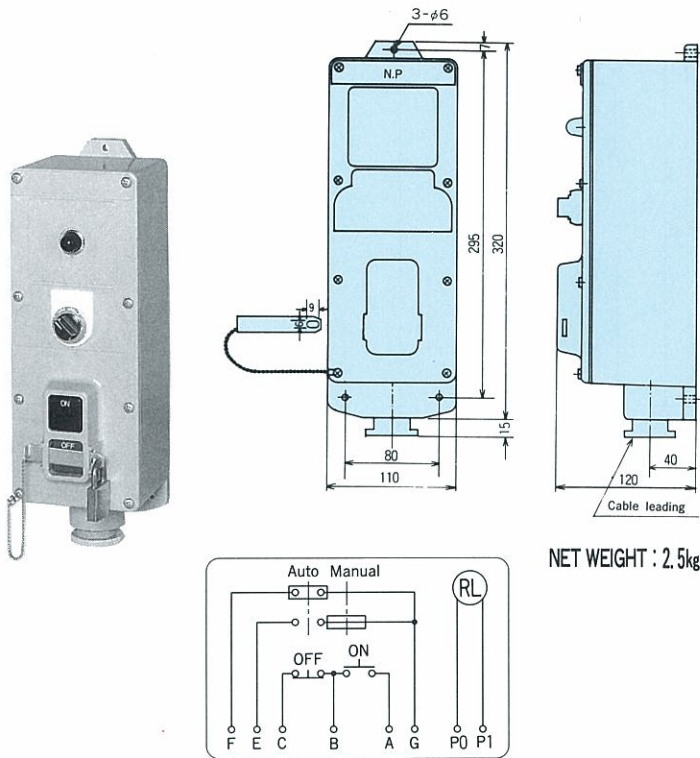
Outside drawing No.16 PBT2-C-LG-P



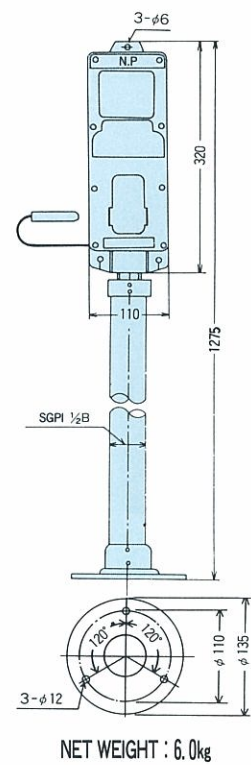
Dimensions & Wiring Diagrams

※Wiring diagrams are common to
Wall mounting type
and Pillar type

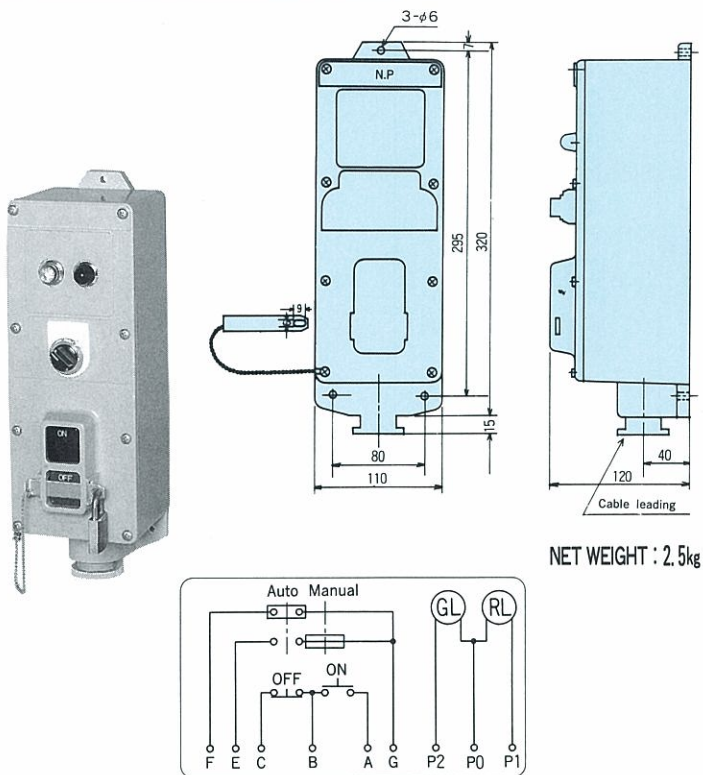
Outside drawing No.17 PBT2-C-GL1



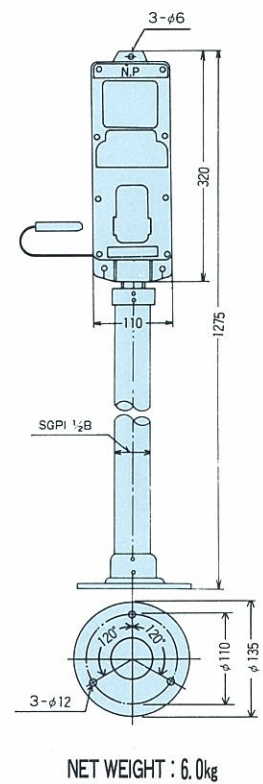
Outside drawing No.18 PBT2-C-GL1 -P



Outside drawing No.19 PBT2-C-GL2



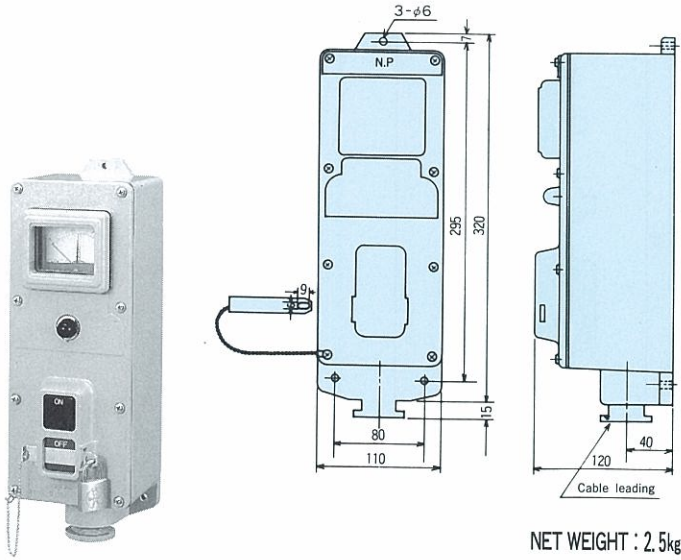
Outside drawing No.20 PBT2-C-GL2-P



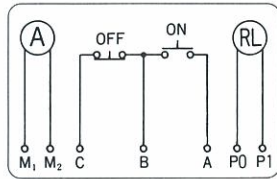
Dimensions & Wiring Diagrams

※ Wiring diagrams are common to
Wall mounting type
and Pillar type

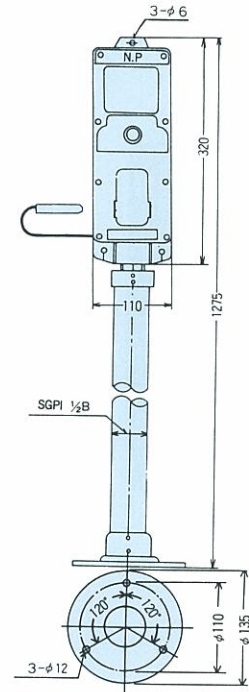
Outside drawing No.21 PBT2-C-XL1



NET WEIGHT : 2.5kg

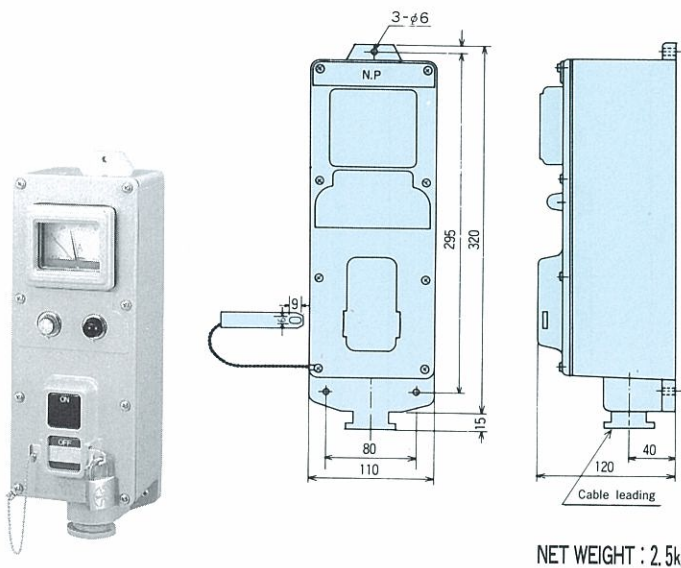


Outside drawing No.22 PBT2-C-XL1-P

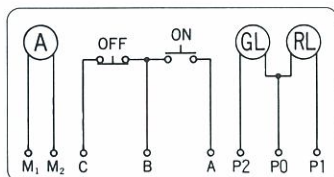


NET WEIGHT : 6.0kg

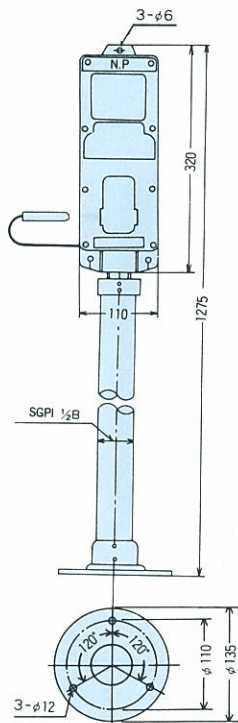
Outside drawing No.23 PBT2-C-XL2



NET WEIGHT : 2.5kg



Outside drawing No.24 PBT2-C-XL2-P

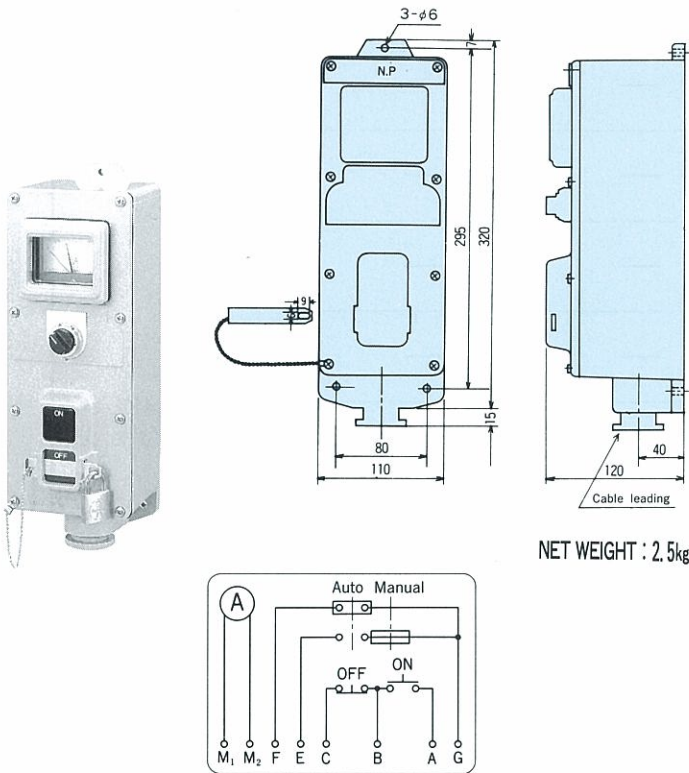


NET WEIGHT : 6.0kg

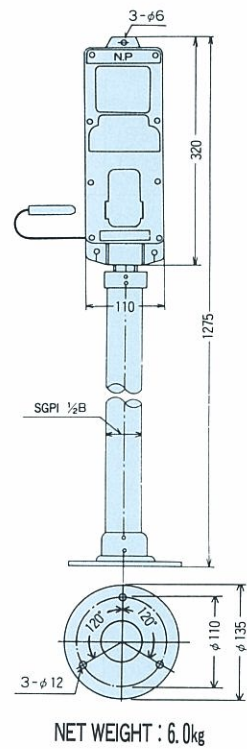
Dimensions & Wiring Diagrams

※ Wiring diagrams are common to
Wall mounting type
and Pillar type

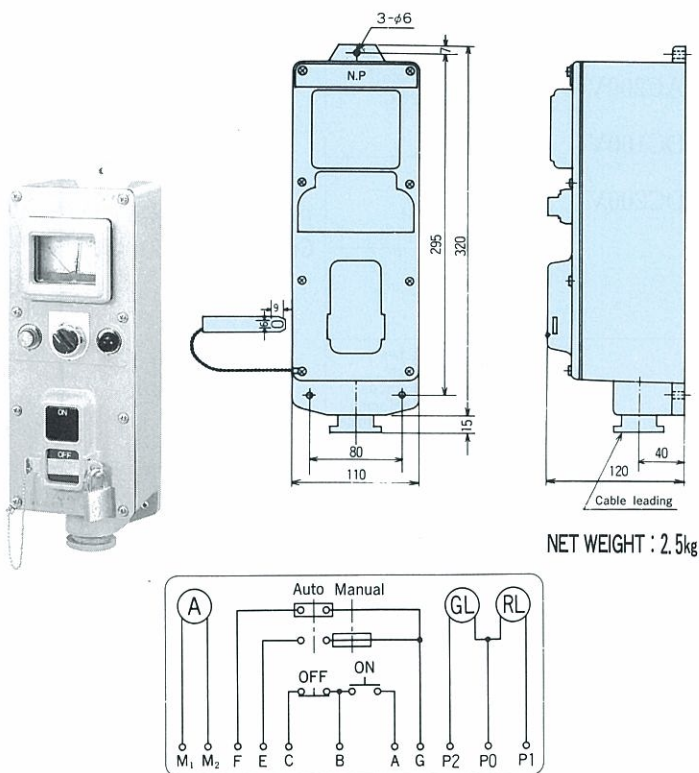
Outside drawing No.25 PBT2-C-XG



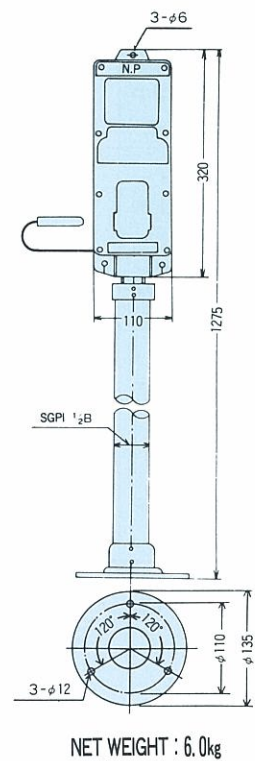
Outside drawing No.26 PBT2-C-XG-P



Outside drawing No.27 PBT2-C-X



Outside drawing No.28 PBT2-C-X-P



FOR ORDERING

For your ordering, please inform us of the following items from the catalogue:

Model No.	Item	Capacity of Ammeter	Voltage of Indicating Lamp	Change-over Switch	Packing I.D. and Cable O.D.
PBT1-C (ON) PBT1-C-P(ON)		—	—	—	Packing dia.: $\phi 17$ Cable O.D.: $\phi 10$ to $\phi 16$
PBT1-C (OFF) PBT1-C-P(OFF)		—	—	—	
PBT2-C PBT2-C-P		—	—	—	
PBT3-C PBT3-C-P		—	—	—	
PBT2-C- A PBT2-C- A -P	* <input type="checkbox"/> A (direct) <input type="checkbox"/> /5A • <input type="checkbox"/> /1A	—	—	—	
PBT2-C- L PBT2-C- L -P	—	<input type="checkbox"/> AC100V <input type="checkbox"/> AC200V	—	—	
PBT2-C- L1 PBT2-C- L1 -P	—	<input type="checkbox"/> DC100V <input type="checkbox"/> DC200V	—	—	
PBT2-C- LG PBT2-C- LG -P	—	—	<input type="checkbox"/> 2-notch; <input type="checkbox"/> 3-notch •Name-Plate Characters <2-notch> <input type="checkbox"/> Auto-Manual <input type="checkbox"/> Please designate <input type="checkbox"/> Remote control- Direct control	—	Packing dia.: $\phi 20$ Cable O.D.: $\phi 15$ to $\phi 19$
PBT2-C-GL1 PBT2-C-GL1-P	—	<input type="checkbox"/> AC100V	<input type="checkbox"/> Auto-OFF-Manual <input type="checkbox"/> Please designate. <input type="checkbox"/> Remote control- OFF-Direct control	—	
PBT2-C-GL2 PBT2-C-GL2-P	—	<input type="checkbox"/> AC200V <input type="checkbox"/> DC100V	•Contact Specifications <input type="checkbox"/> 1NO1NC <input type="checkbox"/> 2NC <input type="checkbox"/> 2NO2NC <input type="checkbox"/>	—	
PBT2-C-XL1 PBT2-C-XL1-P	—	<input type="checkbox"/> DC200V	—	—	
PBT2-C-XL2 PBT2-C-XL2-P	* <input type="checkbox"/> A (direct)	—	—	—	
PBT2-C- XG PBT2-C- XG -P	<input type="checkbox"/> /5A <input type="checkbox"/> /1A	—	<input type="checkbox"/> 2-notch; <input type="checkbox"/> 3-notch •Name-Plate Characters <2-notch> <input type="checkbox"/> Auto-Manual <input type="checkbox"/> Please designate <input type="checkbox"/> Remote control-Direct control	—	
PBT2-C- X PBT2-C- X -P	—	<input type="checkbox"/> AC100V <input type="checkbox"/> AC200V <input type="checkbox"/> DC100V <input type="checkbox"/> DC200V	<3-notch> <input type="checkbox"/> Auto-OFF- Manual <input type="checkbox"/> Please designate. <input type="checkbox"/> Remote control-OFF- Direct control •Contact Specifications <input type="checkbox"/> 1NO1NC <input type="checkbox"/> 2NC <input type="checkbox"/> 2NO2NC <input type="checkbox"/>	—	

* When the current capacity exceeds 10A, either /5A or /1A is available. For the extended scale, "3 times" is standard.

Corrosion-Proof Magnetic Motor Starter(Outer Case:Steel Plates)

How to Select Model No.

P A M G - 2 0 H A B 3 C P

Corrosion-proof magnetic motor starter

Frame size of magnetic motor starter (Refer to Specification and Rating Table.)

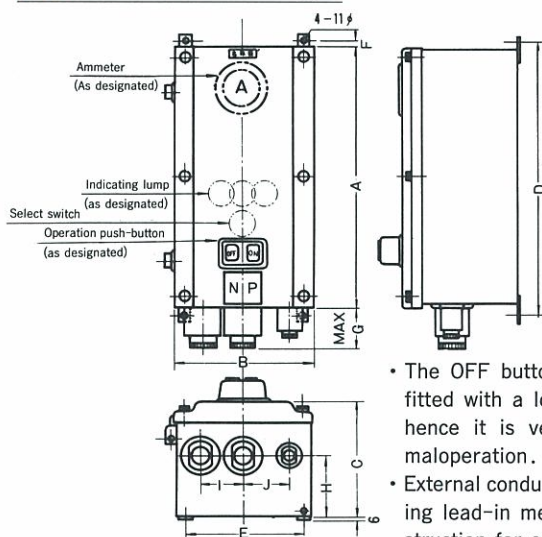
A: w/ammeter

Operation methods

- No indication : Remote control method
- B: Remote-and-direct two-operation method
- D: Direct-control operation method

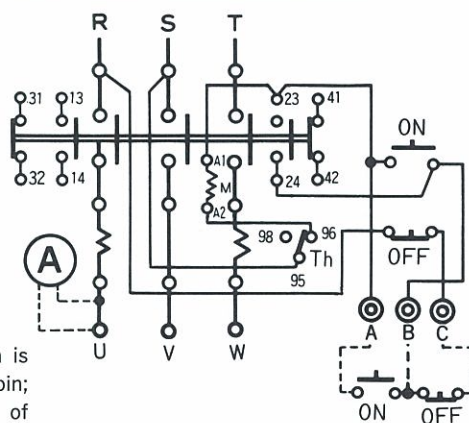
- P: w/transformer
- C: w/current transformer
- w/indicating lamp
 - 1: w/power supply indicating lamp
 - 2: w/operation indicating lamp
 - 3: w/operation and stop indicating lamps
 - 4: w/power supply and operation indicating lamps

Outline Drawings



- The OFF button of operation push-button is fitted with a locking device using a lock-pin; hence it is very safe even at the time of maloperation.
- External conductor lead-in port adopts a packing lead-in method, and is made into a construction for completely tightening the cable.

Connection Drawing



External Dimension Table

Modle No.	A	B	C	D	E	F	G	H	I	J	Weight (kg)											
w/o Ammeter	PAMG- 20H	265	205	175	290	160	13	70	95	65	60	13										
	PAMG- 35H	345	245	205	370	200	"	80	110	75	75	15										
	PAMG- 50H																					
	PAMG- 80H																					
	PAMG-100H																					
PAMG-150H	"	345	245	"	300	"	90	"	100	100	22											
w/Ammeter	PAMG- 20H-A	345	245	205	370	200	"	70	110	75	75	15										
	PAMG- 35H-A																					
	PAMG- 50H-A	465	"	"	490	"	"	80	"	"	"	18										
	PAMG- 80H-A																					
	PAMG-100H-A												565	"	"	590	"	"	"	"	"	20
	PAMG-150H-A												"	345	245	"	300	"	90	"	100	100

Specification and Rating Table

Modle No.	Magnetic starter	Max. Application Load (kW)		Applicable Cable O.D.	
		200~220V	380~440V	Main Circuit	Operation
PAMG- 20H	PAK-20H	4	7.5	12~16	12~16
PAMG- 35H	PAK-35H	7.5	15	15~19	"
PAMG- 50H	PAK-50H	11	22	18~22	"
PAMG- 80H	PAK-80H	19	37	26~31	"
PAMG-100H	PAK-100H	22	45	"	"
PAMG-150H	PAK-150H	40	75	32~39	"

Coating Specifications

- Triple coating
 - Bottom and middle coatings...Epoxy-type resin paint
 - Top coating...Vinyl-type resin paint

Note): In the Case of w/Ammeter

- (a) Up to 30A, a direct ammeter is provided as a standard equipmet, but the ammeter w/CT is also available upon request.
- (b) When 30A is exceeded, the ammeter is w/CT.
- (c) Regardless of the current, the ammeter is w/CT, when the ammeter is to be installed at a far-away place.

Corrosion-Proof Combination Starter(Outer Case:Steel Plates)

How to Select Model No.

G A M G - 0 5 2 H - A B 3 C P

Corrosion-proof
Combination starter

Combination of MCCB and magnetic
starter
Frame size(Refer to Specification and
Rating Table.)

A: W/ammeter

Operation methods

No indication : Remote control method
B: Remote-and-direct two-operation
method
D: Direct-control operation method

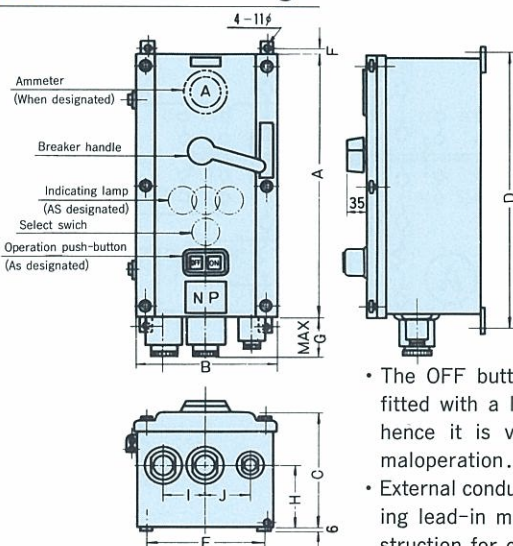
w/indicat-
ing lamp

1: w/power supply indicating
lamp
2: w/operation indicating lamp
3: w/operation and stop
indicating lamps
4: w/power supply and opera-
tion indicating lamps

P: w/transformer

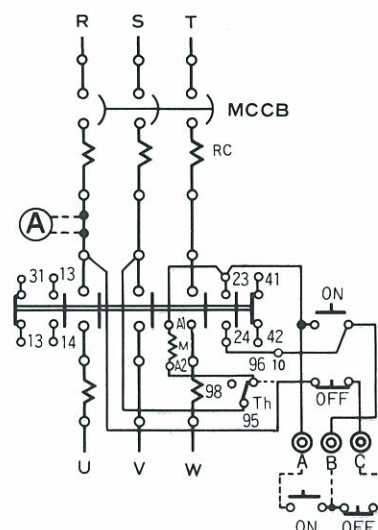
C: w/current transformer

Outline Drawings



- The OFF button of operation push-button is fitted with a locking device using a lock-pin; hence it is very safe even at the time of maloperation.
- External conductor lead-in port adopts a packing lead-in method, and is made into a construction for completely tightening the cable.

Connection Drawing



External Dimension Table

Mode No.		A	B	C	D	E	F	G	H	I	J	Weight (kg)
w/o Ammeter	GAMG-052H	465	245	205	490	200	13	70	110	75	75	17
	GAMG-053H	"	"	"	"	"	"	"	"	"	"	18
	GAMG-055H	565	"	"	590	"	"	80	"	"	"	20
	GAMG-108H	665	"	"	690	"	"	"	"	"	"	23
	GAMG-110H	"	"	"	"	"	"	"	"	"	"	24
	GAMG-215H	765	345	345	790	300	"	90	"	100	100	40
w/Ammeter	GAMG-052H-A	565	245	205	590	200	"	70	"	75	75	20
	GAMG-053H-A	"	"	"	"	"	"	"	"	"	"	21
	GAMG-055H-A	665	"	"	690	"	"	80	"	"	"	23
	GAMG-108H-A	765	"	"	790	"	"	"	"	"	"	26
	GAMG-110H-A	"	"	"	"	"	"	"	"	"	"	27
	GAMG-215H-A	915	345	245	940	300	"	90	"	100	100	47

Specification and Rating Table

Mode No.	Devices Contained		Max. Application Load(kW)		Applicable Cable O. D.	
	MCCB	Magnetic Starter	200~220V	380~440V	Main Circuit	Operation
GAMG-052H	50AF	PAK-20H	4	7.5	12~16	12~16
GAMG-053H	"	PAK-35H	7.5	15	15~19	"
GAMG-055H	"	PAK-50H	11	22	18~22	"
GAMG-108H	100AF	PAK-80H	19	37	26~31	"
GAMG-110H	"	PAK-100H	22	45	"	"
GAMG-215H	225AF	PAK-150H	40	75	32~39	"

Coating Specifications

- Triple coating
 - Bottom and middle coatings...Epoxy-type resin paint
 - Top coating...Vinyl-type resin paint

Note): In the Case of w/Ammeter

- Up to 30A, a direct ammeter is provided as a standard equipment, but the ammeter w/CT is also available upon request.
- When 30A is exceeded, the ammeter is w/CT.
- Regardless of the current, the ammeter is w/CT, when the ammeter is to be installed at a far-away place.

Device Selection Table with Respect to Motor Output

200-V Circuit	Rated Used-Voltage			200-220 [V]								
	Motor Capacity		Total-Load Current [A]	Electro-magnetic Contactor Frame	Thermal Relay		Ammeter CT Ratio [A]	MCCB				
	kW	HP			Mode No.	Rated Current [A]		Standard Product (Interrupting Capacity: 25kA)		Designated Product (Interrupting Capacity: 85kA)		
						Frame	TC Value [A]	Frame	TC Value [A]			
0.1	1/8	0.8	PAK-20H	T-35 (T-35-3) (GT-35)	0.7	3	50AF	RC10	High-Performance Type 50AF	RC15		
0.2	1/4	1.4			1.2	3						
0.4	1/2	2.6			2.3	3						
0.75	1	4.2			3.6	5						
1.1	1 1/2	6			5	7.5						
1.5	2	7.4			6.7	7.5						
2.2	3	10			9.2	10						
2.5					11	15						
2.7					11	15						
3		12			13	15						
3.7	5	16			15	20						
4		17			18	20						
5.5	7 1/2	25			22	30						
7.5	10	30			30	50						
11	15	47	PAK-50H	T-50 (T-50-3) (GT-50)	42	50	Economy Type 100AF	TC975	High-Performance Type 100AF	TC975		
15	20	63			56	75					TC1300	TC1300
19	25	78	PAK-80H	T-125 (T-125-3) (GT-125)	68	100	Economy Type 225AF	TC1650	High-Performance Type 225AF	TC1550		
22	30	90			80	100					TC1930	TC1930
26	35	102	PAK-150H	T-125 (T-125-3) (GT-125)	110	150	Economy Type 225AF	TC1930	High-Performance Type 225AF	TC1650		
30	40	120			110	150					TD2200	TC1930
37	50	146			130	150					TC2480	TC2200
40		156			130	200					TC2480	TC2480

400-V Circuit	Rated Used-Voltage			380-440 [V]								
	Motor Capacity		Total-Load Current [A]	Electro-magnetic Contactor Frame	Thermal Relay		Ammeter CT Ratio [A]	MCCB				
	kW	HP			Mode No.	Rated Current [A]		Standard Product (Interrupting Capacity: 10kA)		Designated Product (Interrupting Capacity: 50kA)		
						Frame	TC Value [A]	Frame	TC Value [A]			
0.1	1/8	0.4	PAK-20H	T-35 (T-35-3) (GT-35)	0.35	3	50AF	RC10	High-Performance Type 50AF	RC15		
0.2	1/4	0.7			0.7	3						
0.4	1/2	1.3			1.2	3						
0.75	1	2.1			1.8	3						
1.1	1 1/2	3			2.3	3						
1.5	2	3.7			3.6	5						
2.2	3	5			4.6	5						
2.5					5	7.5						
2.7					5	7.5						
3		6			5	7.5						
3.7	5	8			7.5	10						
4		8.5			7.5	10						
5.5	7 1/2	12.5			11	15						
7.5	10	16.5			15	20						
11	15	23.5	PAK-35H	T-50 (T-50-3) (GT-35)	22	30	Economy Type 100AF	TC450	High-Performance Type 100AF	TC390		
15	20	31.5			30	50					TC600	TC520
19	25	39	PAK-50H	T-50 (T-50-3) (GT-35)	34	50	Economy Type 100AF	TC750	High-Performance Type 100AF	TC650		
22	30	45			42	50					TC975	TC650
26	35	51	PAK-80H	T-125 (T-125-3) (GT-125)	48	75	Economy Type 225AF	TC1300	High-Performance Type 225AF	TC975		
30	40	60			56	75					TC1760	TC1300
37	50	73	PAK-100H	T-125 (T-125-3) (GT-125)	68	75	Economy Type 225AF	TC1930	High-Performance Type 225AF	TC1550		
40		78			68	100					TC2200	TC1550
45	60	87	PAK-150H	T-125 (T-125-3) (GT-125)	80	100	Economy Type 225AF	TC1650	High-Performance Type 225AF	TC1650		
50		98			90	100					TC1760	TC1760
55	75	110			110	150					TC1930	TC1760
60		116			110	150					TC2200	TC2200
75	100	137			130	150						

CORROSION-PROOF TYPE CONTROL SWITCHES

Electronic Control Power Distribution System



HEAD QUARTERS

1 - 1 OHTAKARA-KITAMACHI, SAGA-CITY, 840, JAPAN
Telephone SAGA 0952(24)4111 (KEY NUMBER)
Telex 07463-73

TOKYO BRANCH, EXPORT AND INPORT SECTION

TORANOMON JITSUGYO KAIKAN BLDG.
1 - 1 -20 TORANOMON, MINATO-KU, TOKYO 105, JAPAN
Telephone TOKYO (3508) 7541 / 3
Telex 222517 TOGAMI

The data given in this catalog are subject to change without notice. Printed in Japan.