

Shanghai Liangxin Electrical Co., Ltd.

P02083-NDM3G-250V Disconnecting Switch

Product Specification

(IPD-ENG-DEV-T20 A1 2016-09-23)

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Revision History					
Version	Revision Reason/Content	Implementati on Date	Prepared by	Reviewe d by	Approve d by
0	New addition	20200819	Xie Wei	Zhang Ying	Cao Jian
1	Ith instead le	20210221	Xie Wei	Zhang Ying	Wu Ya Li
2	Model explanation changed to samle	20210225	Xie Wei	Zhang Ying	Wu Ya Li
3	Update capacity reduction factor	20221205	Yang rongrong	Xu fuping	Ding fei
4	Normalized information update for attachment p ackage	20240413	Yang rongrong	Xu fuping	Ding fei

1. Application Scope and Purpose of Disconnecting Switch

The NDM3G-250V series of molded case disconnecting switches with the rated insulation voltage of 1250V, the rated working voltage of AC 1140V and the Rated working current of 250A are applicable to the distribution circuit and motor circuit, which are used as power switches, disconnecting switches and emergency switches. The product can also be used for the accidental on-off of the motor as well as infrequent making and breaking.

The Disconnecting Switch has an isolating function with the corresponding symbol of



Comply with standards: IEC60947-3, GB/T 14048.3.

Products comply with CCC、CE、TUV and CB certification.

Disconnecting Switch can be connected by lower incoming line.

2. Picture of the Disconnecting Switch Product (The picture is for reference only; the specific kind prevail)



Picture of the Product

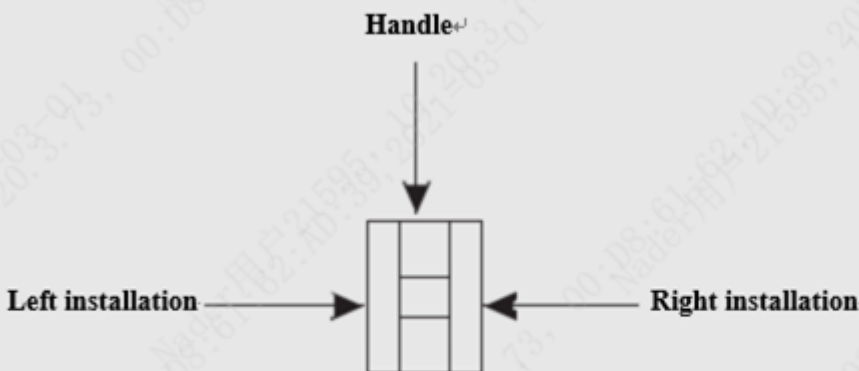
3. Specification and Model Description of Disconnecting Switch

ND 1	M 2	3 3	G 4	- 5	☐ 6	☐ 7	/ 8	☐ 9	☐ 10	☐ 11	☐ 12
SN	SN name	NDM3G									
1	Enterprise code	ND: "Nader" brand low-voltage apparatus									
2	Product code	M: Molded case disconnecting switch									
3	Design SN	3									
4	Derived code of	G: Disconnecting switch									
5	Shell frame level	250									
6	Derived code of	V: High voltage									
7	Operation mode	No code: Direct handle-operated									
		P: Motor-operated									
		Z: Rotation handle									
8	Number of poles	30:3P									
9	Accessory code	See Table 1									
10	Rated working	See Table 2									
11	Connection mode	No code: Conventional products									
		P: Connection row									
12	Other code	CS1-A/150: Circular center hole rotary handle + shaft length 150mm									
		CS1-A/200: Circular center hole rotary handle + shaft length 200mm									
		CS1-A/300: Circular center hole rotary handle + shaft length 300mm									
		CS1-A/350: Circular center hole rotary handle + shaft length 350mm									
		CS1-A/650: Circular center hole rotary handle + shaft length 650mm									
		CS1-F/150: Square center hole rotary handle + shaft length 150mm									
		CS1-F/200: Square center hole rotary handle + shaft length 200mm									
		CS1-F/300: Square center hole rotary handle + shaft length 300mm									
		CS1-F/350: Square center hole rotary handle + shaft length 350mm									
		CS1-F/650: Square center hole rotary handle + shaft length 650mm									
		CS2-A/150: Circular eccentric hole rotary handle + shaft length 150mm									
		CS2-A/200: Circular eccentric hole rotary handle + shaft length 200mm									
		CS2-A/300: Circular eccentric hole rotary handle + shaft length 300mm									
		CS2-A/350: Circular eccentric hole rotary handle + shaft length 350mm									
		CS2-A/650: Circular eccentric hole rotary handle + shaft length 650mm									
		CS2-F/150: Square eccentric hole rotary handle + shaft length 150mm									
		CS2-F/200: Square eccentric hole rotary handle + shaft length 200mm									

		CS2-F/300: Square eccentric hole rotary handle + shaft length 300mm
		CS2-F/350: Square eccentric hole rotary handle + shaft length 350mm
		CS2-F/650: Square eccentric hole rotary handle + shaft length 650mm
		CS1-IP65/150/200/300/350/650: IP65 Square center hole rotary handle + shaft length 150/200/300/350/650mm
		CS2-IP65/150/200/300/350/650: IP65 Square eccentric hole rotary handle + shaft length 150/200/300/350/650mm
		DC1 24V:Electric operation voltage DC24V
		DC1 110V: Electric operation voltage AC/DC110V
		DC1 220V: Electric operation voltage AC230V/DC220V
		DC1 380V: Electric operation voltage AC380/400/415V
		MS2: MS2 lock
		AC230V: Shunt release operation voltage AC220V/AC230V
		AC380V: Shunt release/ Under-voltage release operation voltage AC380V/AC400V/AC415V
		DC24V: Shunt release operation voltage DC24V
		DC220V: Shunt release operation voltage DC220V
		Z: Terminal housing
		MS2: MS2 lock
		DB: Insulating base plate*

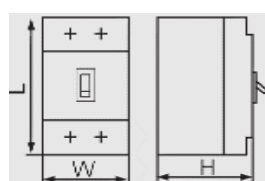
Note: NDM3G-250V standard insulating base plate.

Table 1: Comparison Table of Accessory Code

			Legend  Single auxiliary contact  Dual-auxiliary contact  Shunt release  Under-voltage release
Accessory code	Accessory name	Installation Position	Model
		poles	NDM3G-250V
00	N/A		
20	Dual-auxiliary contact		
21	Single auxiliary contact		
10	Shunt release		
70	Under-voltage release, Dual-auxiliary contact		

4. Main Technical Parameters of Disconnecting Switch

Table 2 Main Technical Parameters of Disconnecting Switch

Model			NDM3G-250V		
Rated working current I _e (A)			250		
Rated voltage U _e (AC V)			1140		
Rated insulation voltage U _i (V)			1250		
Rated impulse withstand voltage U _{imp} (V)			8000		
Power frequency withstand voltage U (1min) (V)			3500		
Rated short-time withstand current I _{cw} (kA)			3/1s		
Rated short circuit making capacity I _{cm} (kA)			3		
Utilization category			AC-21B		
Number of poles			3		
Operating performance (times)	Electrical life		1000		
	Mechanical life	Maintenance free life	10000		
		Maintenance life	20000		
Boundary dimension			L(mm)	165	
			W(mm)	107	
			H(mm)	105	
Flashover distance(mm)			≤50		

Note :The overall dimension does not include the dimension of terminal cover。

NDM3G-250V standard insulated floor.

4.1 Selection of the disconnecting switch connecting bus or cable cross-section area:

Table 3 Selection of the NDM3G-250V Connecting Bus or Cable Cross-section Area

Rated current (A)	250
Wire cross-section area (mm ²)	120

4.2 Tightening Torque of the Disconnecting Switch Terminal and Mounting Screw

Table 4 Tightening Torque of the Disconnecting Switch Terminal and Mounting Screw

Model	Thread specification	Torque (N·m)
NDM3G-250V	M8	12
	M4	1.5

4.3 Derating factor of temperature change for the disconnecting switch

Table 5 Derating Factor Table of Temperature Change for the Disconnecting Switch

Model	Derating factor of product temperature change							
NDM3G-250V	Temperature (°C)	40	45	50	55	60	65	70
	Derating factor	1	1	1	0.95	0.93	0.91	0.88

Note: 1) When the operating ambient temperature is below 50°C, the product can be used normally without derating capacity.

2). The above derating factors are measured at the Rated working current.

4.4 High-altitude derating factor of disconnecting switch

Table 6 High-altitude Derating Factor Table of Disconnecting Switch

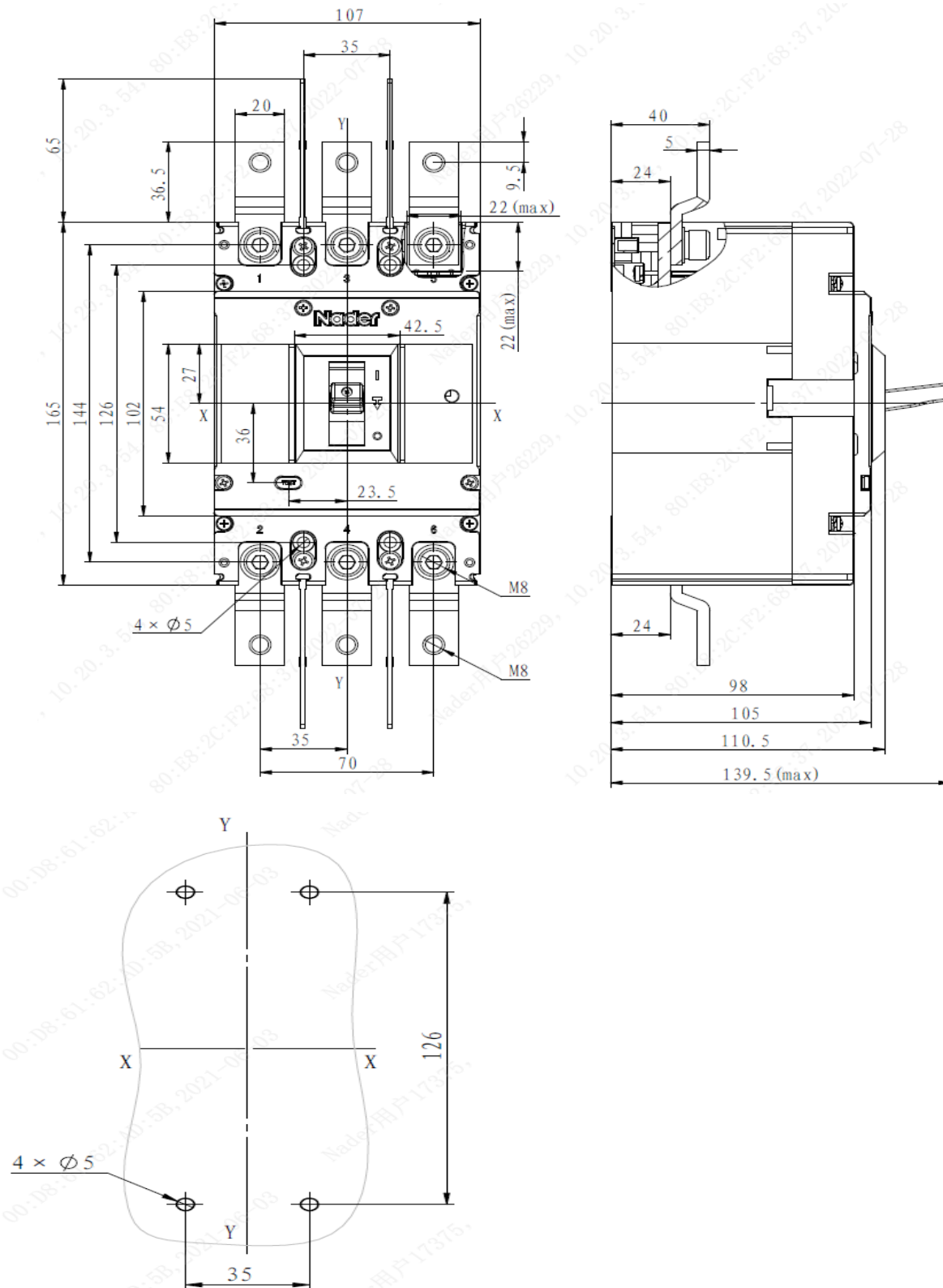
Altitude (m)	Correction factor of the working current	Correction factor of the working voltage	Power frequency withstand voltage(V)	Correction factor of the power frequency withstand voltage (V)
2000	1	1140	3500	1250
2500	1	1140	3500	1250
3000	0.98	1140	3500	1250
3500	0.97	1140	3500	1250
4000	0.95	1140	3500	1250
4500	0.94	877	2650	962
5000	0.93	832	2500	912

5. Normal Working Environment of Disconnecting Switch

- 1) The altitude of the installation site doesn't exceed 2,500m. See the "High-altitude Derating Factor Table of Disconnecting Switch" for the derating factor at the altitude;
- 2) The ambient temperature is $-35^{\circ}\text{C} \sim +70^{\circ}\text{C}$; the average w_{le} in 24 h shall not be more than $+35^{\circ}\text{C}$. If the ambient temperature is higher than $+50^{\circ}\text{C}$, the user needs to reduce the capacity. See the "Derating Factor Table of Temperature Change for the Disconnecting Switch" for the derating factor;
- 3) The relative humidity at an ambient temperature of $+40^{\circ}\text{C}$ should not exceed 50%. A higher relative humidity is allowed at a lower temperature, for example: The relative humidity at 20°C can reach 90%. For frost due to temperature change, the corresponding measures should be taken;
- 4) The product can withstand the effects of wet air, salt mist, oil mist and mould;
- 5) The installation category for disconnecting switch connected to the main circuit is: Category III (power distribution and control level), the installation category where the disconnecting switch is not connected to the main circuit is: Category II (load level);
- 6) The pollution level is Level 3;
- 7) The product should be installed in places that are free from explosive media, media corrosive to metal, insulation damaging gas, and conductive dust, which should be also avoided from snow and rain;
- 8) In case of stricter user conditions than the above description, negotiate with the manufacturer.

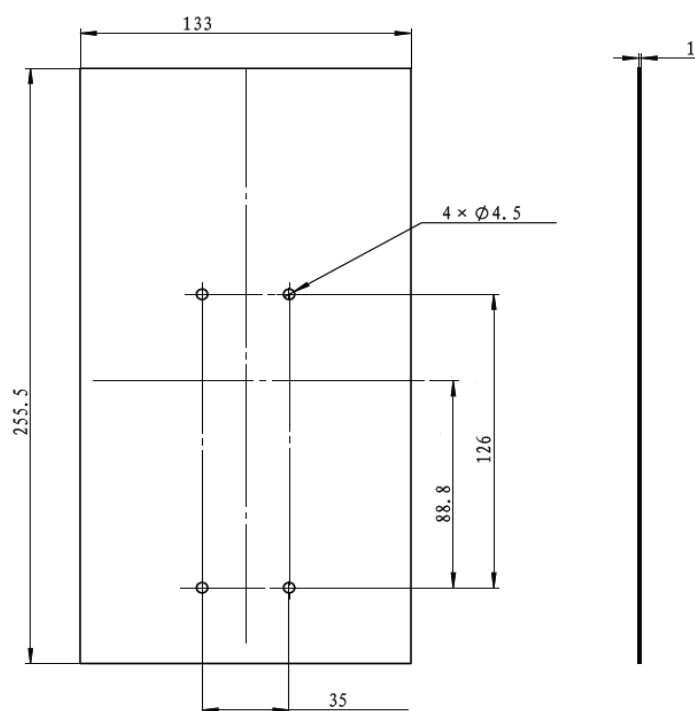
6. Outline, Mounting Hole Dimensions and Safety Distance of Disconnecting Switch

6.1 Outline and mounting hole dimensions of disconnecting switch ((Unit: mm))



Note: The limit deviation not indicated wle the tolerance dimensions is as per GB/T 1804-c.

6.2 Insulating base plate (Unit: mm)



Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

6.3 Safe mounting distance of disconnecting switch

Table 7 Insulation Distance Mounted in the Metal Cabinet (Unit: mm)

Mounting distance	A (inlet wire end to the cabinet face)	B (distance from side to the cabinet face)	C (outlet wire end to the cabinet face)
NDM3G-250V	65	30	30

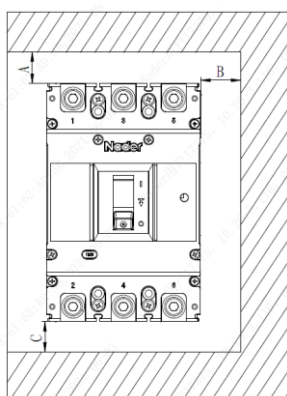


Table 8 Minimum Center Distance between Rowed Disconnecting Switches (Unit: mm)

Model	Disconnecting switch width	I Center distance
NDM3G-250V	107	137

Note: Check the connected busbar or cable during rowing or stacking of the disconnecting switch to ensure that the air insulation distance won't be reduced.

Note: The limit deviation not indicated while the tolerance dimensions is as per GB/T 1804-c.

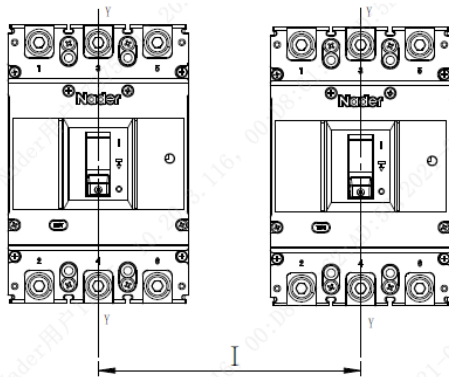


Table 9 Minimum Center Distance between Stacked Disconnecting Switches (Unit: mm)

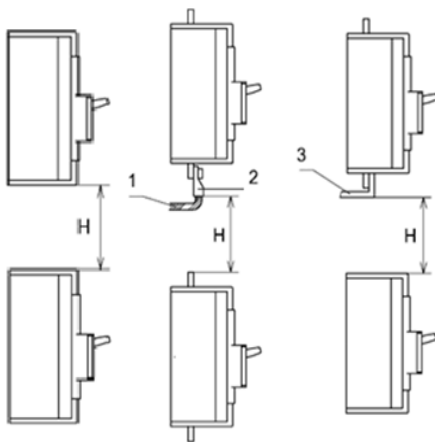
Model	H (distance of disconnecting switch from bottom)
NDM3G-250V	93

Note: 1) Insulated cable

2) Cable terminal

3) Connection without insulation

Requirements: Check whether the phase partition is assembled properly before products are energized.



7、 Attachment function description

7.1 Under-voltage release

When the power voltage drops to the range (35%~70%) of the under-voltage release, the release can break the Disconnecting Switch reliably; when the power voltage is 35% lower than the rated working voltage of the under-voltage release, the release can prevent closing of the Disconnecting Switch; when the power voltage is 85% higher than the rated working voltage of the under-voltage release, the release can guarantee reliable closing of the Disconnecting Switch.

Table 10 Voltage Specifications and Power Consumption of Under-voltage Release

Model	Instantaneous current value(A)		Power waste (W)	
	AC380V	AC230V	AC380V	AC230V
NDM3G-250V	0.01	0.006	0.3	0.3

Note: The under-voltage release must be energized before the Disconnecting Switch can be switched on and closed again, otherwise the Disconnecting Switch will be damaged.

7.2 Auxiliary contact

The circuit breaker is in the "open" and "free tripping" positions	Dual-auxiliary contact	
	Single auxiliary contact	
the circuit breaker is in the "close" position	"close" to "open"、" open " to " close "	

7.2.1 Current parameters of auxiliary contact

Table 11 Current parameters of auxiliary contact

Model	Conventional thermal current Ith (A)	Rated working current Ie(A)	
		AC400V (AC-15)	DC220V (DC-13)
NDM3G-250V	3	1.5	0.15
Note :minimum applicable load: 5V, 1mA.			

7.2.2 Electrical life of auxiliary contact

Table 12 Electrical life of auxiliary contact

Usage category	On			Off			Times	Frequency	Power on time
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95ms

7.2.3 Making and breaking capacity of auxiliary contact

Table 13 Making and breaking capacity of auxiliary contact

Usage category	On			Off			Times	Frequency	Power on time
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1.1	0.3	10	1.1	0.3	10	360	≥0.05s
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			≥T0.95ms

7.3 Shunt release

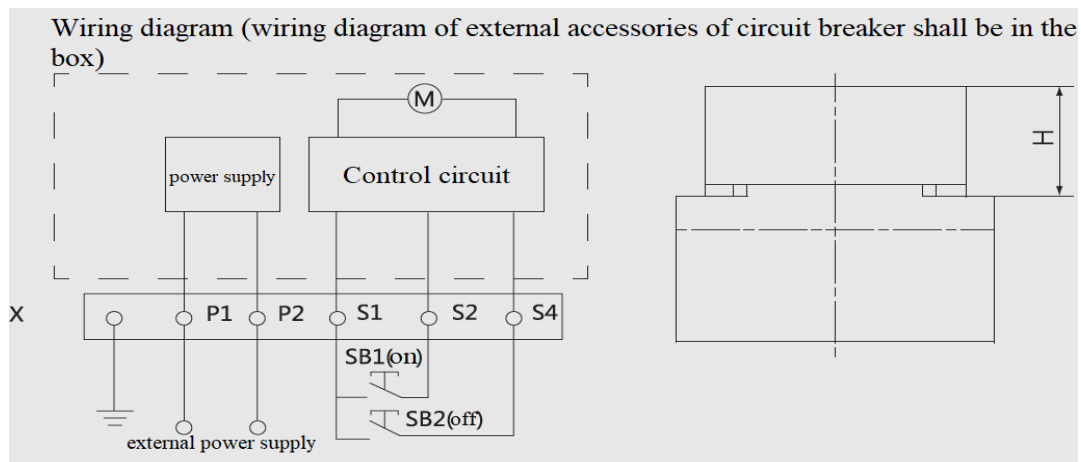
When the external voltage of the shunt release is between 70% and 110% of the rated control power voltage, the release can break the Disconnecting Switch reliably.

Table 14 Voltage Specifications and Power Consumption of shunt release

Model	Shunt release	DC24V	AC230V	DC220V	AC380V
NDM3G-250V	Instantaneous current value(A)	4	0.25	0.24	0.43
	Power waste (W)	97.6	57.5	52.6	173.9

Note: Shunt release, auxiliary contact and alarm contact wiring standard wire length is 0.7m, 1m、2m、4m can be customized according to demand 。

7.4 Electric operating mechanism



Symbol description: SB1、SB2: Operation button (provided by the customer)

X: Terminal block

P1、P2: External power supply

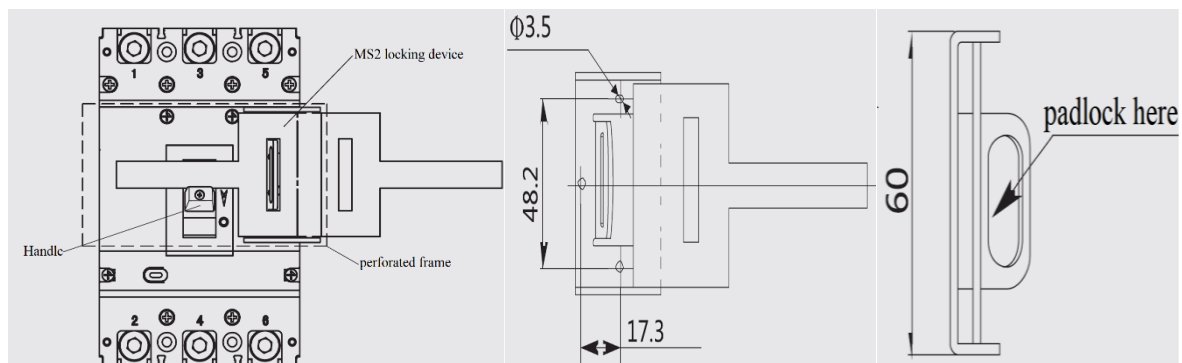
Voltage specification: AC 50Hz AC110V、AC220V、AC400V、DC24V、DC110V、DC220V

Table 15 Main technical parameters of electric operating mechanism

Equipped with Disconnecting Switch	Electric power(W)				service life / time	H(mm) Operating mechanism height H(mm)
	AC/DC220V	AC/DC110V	AC380V	DC24V		
NDM3G-250V	≤180	≤180	≤350	80	10000	92

7.5 MS2 locking device

MS2 is a split locking device (i.e. the device is installed on the left or right side of the Disconnecting Switch cover, and the default is installed on the right side if there are no special requirements). It is used for NDM3G series products to prevent manual closing and opening (the dotted line part is the Disconnecting Switch part).



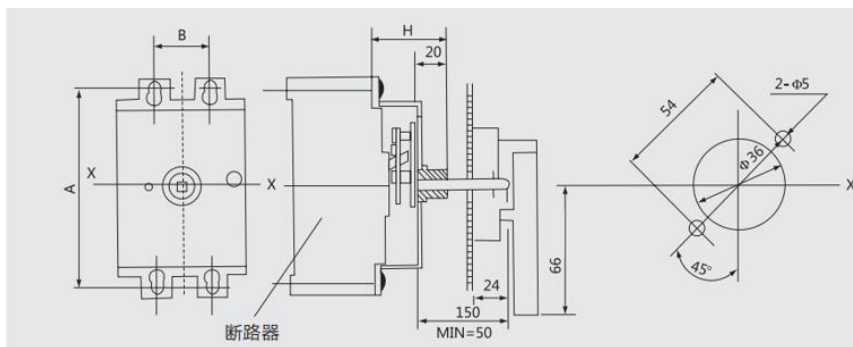
Installation diagram of MS2 lock mechanism (Unit: mm)

Note 1: After MS2 accessories are selected, other internal and external accessories cannot be installed on the same side;

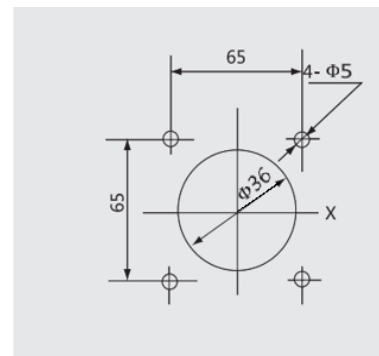
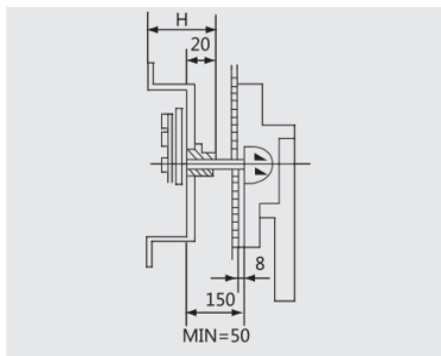
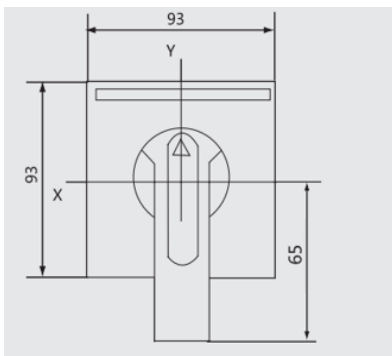
The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7.6 Manual operating mechanism

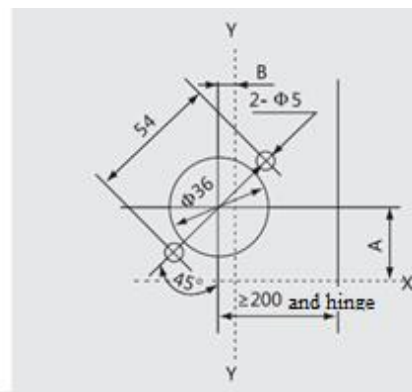
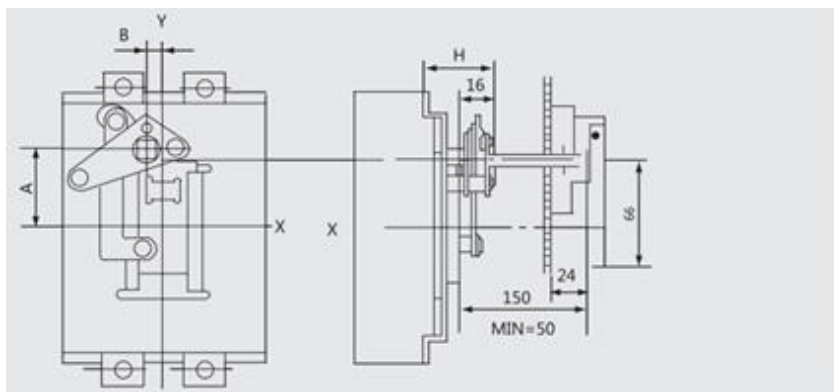
7.6.1 Electric operating mechanism and CS1-A handle



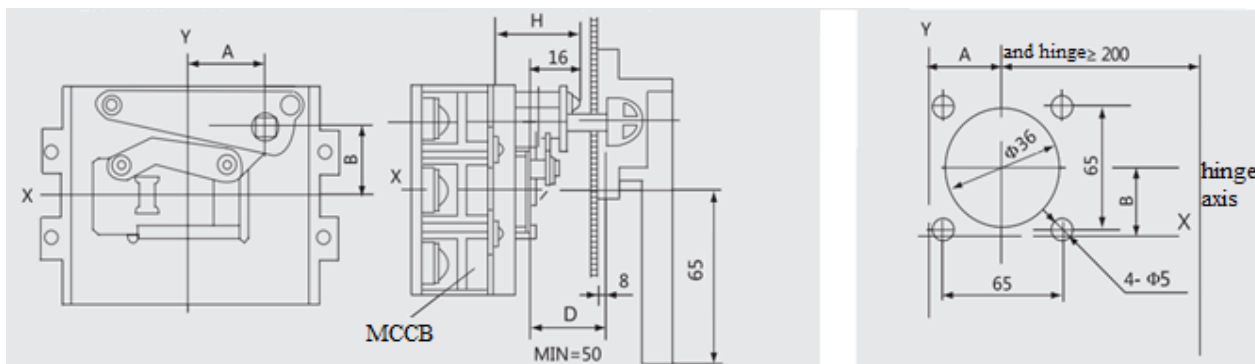
7.6.2 Electric operating mechanism and CS1-F handle



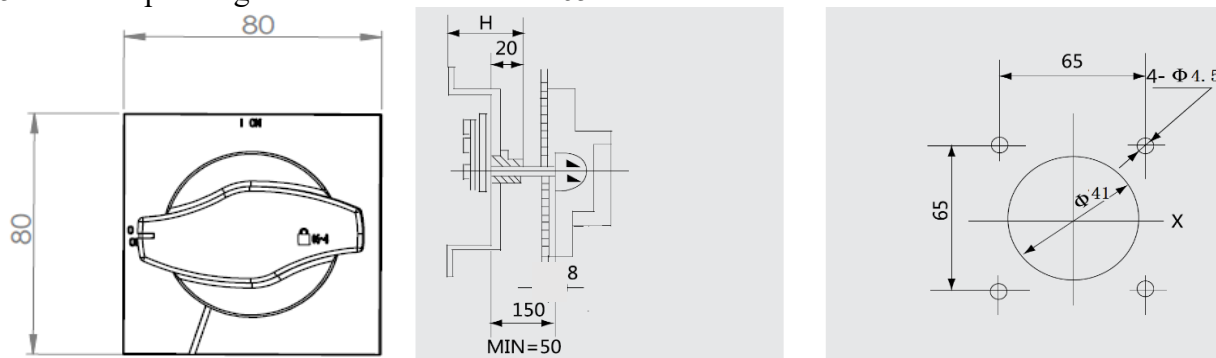
7.6.3 Electric operating mechanism and CS2-A handle



7.6.4 Electric operating mechanism and CS2-F handle



7.6.5 Manual operating mechanism and CS1-IP65 handle



7.6.6 Manual operating mechanism and CS2-IP65 handle

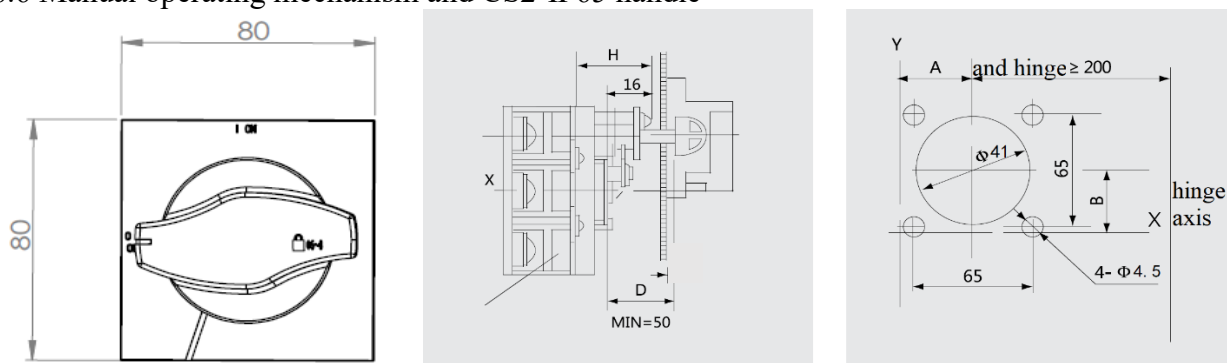


Table 16 Installation dimension of manual operating mechanism (Unit: mm)

Manual operation type	Equipped with Disconnecting Switch	Installation dimension of manual operating mechanism			Installation mode
		H	A	B	
CS1-225	NDM3G-250V	55	143	35	Vertical installation
CS2-225	NDM3G-250V	48	35	31	

Note :1) A type is round handle, F type is square handle;

2) The length of A-type handle is 66mm and that of F-type handle is 65mm;

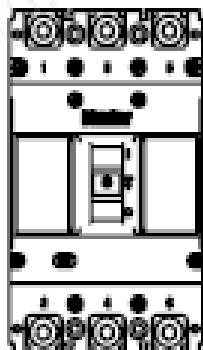
3) The D dimension in the drawing is 150mm by default, and the customizable length is 200 / 300 / 350 / 650mm;

4) The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

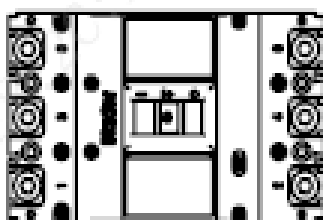
8. Installation Direction of Disconnecting Switch

For vertical installation of the product, the gradient between the installation surface and the vertical plane is no more than $\pm 22.5^\circ$.

Horizontal installation of the product.



Vertical Installation



Horizontal Installation

9. Packaging and Storage of Disconnecting Switch

Minimum packaging quantity: 1 piece/box. The packaged products should be stored in a warehouse with the air ventilation and the relative humidity no more than 80% when the ambient temperature is $-40^\circ\text{C} \sim 75^\circ\text{C}$. No acidic alkaline or other corrosive gas exists in the ambient air in the warehouse. Under the conditions above, the storage period shall be no more than three years since the manufacturing date.

10. Environmental compliance

The product meets ROHS standard.

11. Installation Accessory List of Disconnecting Switch

SN	Name	Specification	3P Quantity/Set
1	Cross small pan-head screw	M4×45	4
2	Hexagon nut	M4	4
3	Plain washer	4	4
4	Phase partition	——	4
5	Insulating base	——	1
6	Hexagon socket cylindrical head combination	M8×22	6

12. Precautions for Disconnecting Switch

- 1) Various characteristics and accessories of the disconnecting switch are set in the factory. The disconnecting switch or other accessories can only be adjusted, installed and maintained by the trained or qualified professionals according to the parameter requirements of the line design;
- 2) Ensure that the power supply is off before installing or removing any device;
- 3) The disconnecting switch handle can be located in three positions, indicating three states: on, off and free tripping. When the handle is in the free tripping position, pull the handle in the off direction when the disconnecting switch is connected and on.