



Creative solutions for connecting, switching, selecting and controlling industrial processes.

## OVERLAY WRENCHES FOR ENGINE



The line of override switches for THS engines was developed to meet most of the functions required in engine operation, such as starting/stopping, starting, changing direction of rotation, transfer, changing rotation speeds, among others.

Its structure, both base and cover, are made of electrostatically painted steel, providing greater resistance to bad weather and the key body developed in engineering polymers guarantees the operator greater safety in relation to electrical insulation.

MODELS <i>Three-phase line</i>	WORK CHAINS (I <sub>n</sub> )					
	15A	20A	30A	40A	60A	90A
On-off	LD15	LD20	LD30	LD40	LD60	LD90
On-Off-On	LDL15	LDL20	LDL30	LDL40	LDL60	LDL90
Reverse	R15	R20	R30	R40	R60	R90
Reverse with/Return	RR15	RR20	RR30	RR40	RR60	RR90
Transf. Network/Generator	TRG15	TRG20	TRG30	TRG40	TRG60	TRG90
Dual Voltage	DV15	DV20	DV30	DV40	DV60	DV90
Star-Triangle	ETR15	ETR20	ETR30	ETR40	ETR60	ETR90
Dual Polarity (Dahlander)	DH15	DH20	DH30	DH40	DH60	DH90
<i>Single-phase Line</i>						
On-off	MLD15	MLD20	MLD30	MLD40	MLD60	MLD90
On-Off w/Prot.	MLDP15	MLDP20	MLDP30	-	-	-
Reverse	MR15	MR20	MR30	MR40	MR60	MR90
Dual Voltage	MDV15	MDV20	MDV30	MDV40	MDV60	MDV90
Series/Parallel Match	PSP15	PSP20	PSP30	PSP40	PSP60	PSP90



SECURITY | TECHNOLOGY | EXPERIENCE | QUALITY

# OVERLAY WRENCHES FOR ENGINE

TABLE FOR SELECTING CURRENT AS A FUNCTION OF VOLTAGE AND POWER.

MODELS <i>Three-phase line</i>	U <sub>e</sub>	POWER (CV)					
		15A	20A	30A	40A	60A	90A
On-off	220V~	2 CV	3 CV	7,5 CV	7,5 CV	10 CV	15 CV
On-Off-On							
Reverse	380V~	3 CV	5 CV	10 CV	10 CV	15 CV	25 CV
Reverse with Return	440V~	4 CV	6 CV	10 CV	12,5 CV	20 CV	30 CV
Transf. Network/Generator							
Dual Voltage	220V~	5 CV	7,5 CV	10 CV	12,5 CV	20 CV	30 CV
Star-Triangle	380V~	7,5 CV	10 CV	12,5 CV	15 CV	25 CV	40 CV
Dual Polarity (Dahlander)	440V~	10 CV	10 CV	12,5 CV	15 CV	25 CV	40 CV
<b>Single-phase Line</b>							
On-off	127V~	0,5 CV	1 CV	1,5 CV	2 CV	3 CV	5 CV
On-Off with Prot.	220V~	1,5 CV	2 CV	3 CV	5 CV	7 CV	10 CV
Reverse	440V~	2 CV	2 CV	3 CV	5 CV	7 CV	10 CV
Dual Voltage (F-N)	220V~	2 CV	4 CV	5 CV	6 CV	12,5 CV	15 CV
Series/Parallel Match							

Note: for this table, engine efficiency was considered: 80% and cos : 0.8

## Find out a little more about each model

**On-Off:** Known as a direct start switch, this switch has the function of turning on and off an engine or electrical equipment. It can be found in a three-phase or single-phase version.

**On-Off-On:** Its function is similar to the On-Off switch, but its on position can be operated both clockwise and counterclockwise. It can be found in a three-phase or single-phase version.

Note: This model cannot be used as a selector, as it only comes from an input and output set..

**Reverser:** Its function, in addition to turning it on and off, also acts to reverse the direction of engine rotation. It can be found in a three-phase or single-phase version.

**Reverser with Return:** Its function is similar to the reverser, but it always returns to position "0" when releasing the handle. It is generally used in winches and forklifts. Available in three-phase or single-phase version.

**Tranf. Mains/Generator:** Also known as manual transfer switch. It allows you to transfer power from the utility to a generator or even connect two engines alternately.

**Dual Voltage:** Used in equipment that can operate on two service voltages 220/380V. This switch allows you to choose, depending on the availability of power, at which voltage the equipment will operate. It is generally used in refrigerated trucks.

**Star-Delta:** The function of the star-delta switch is to provide a "smoother" start for three-phase motors. In the star option, it is necessary to hold the lever in position, as it returns to position "0" for safety.

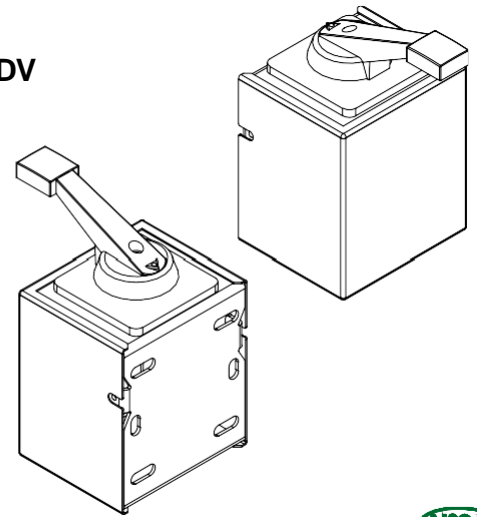
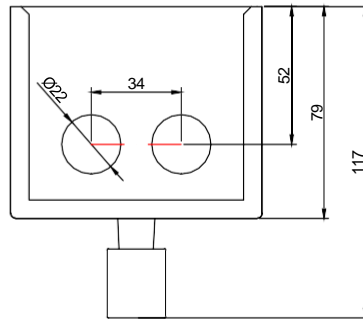
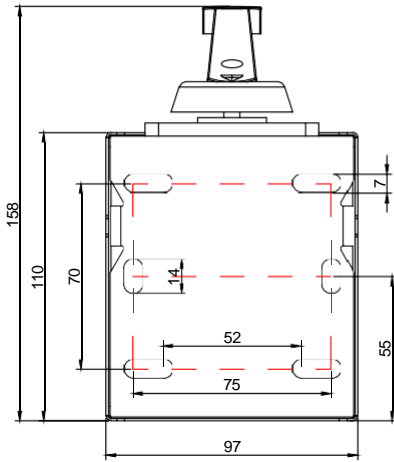
**Dual Polarity:** Used to control two-speed motors, where speed change is necessary in operation. Generally used in Dahlander type engines.



SECURITY | TECHNOLOGY | EXPERIENCE | QUALITY

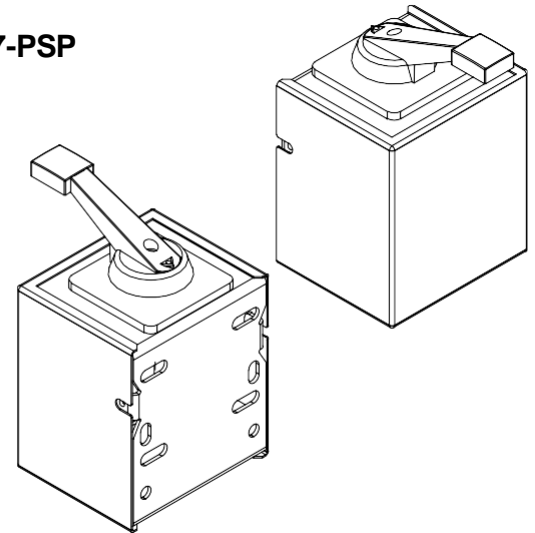
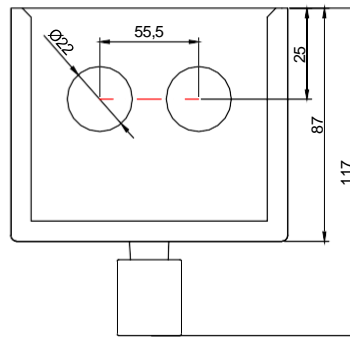
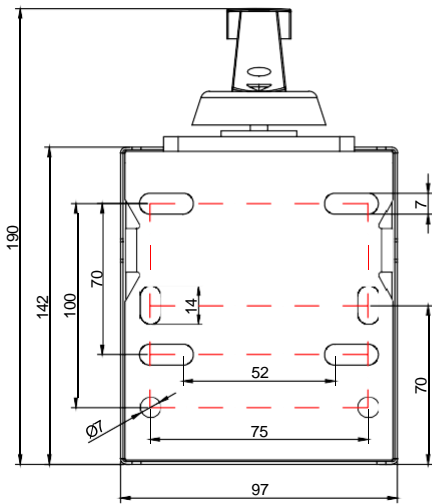
# OVERLAY WRENCHES FOR ENGINE

**Line LD-LDL-R-RR-MLD-MR220-MDV**  
Chain: 15 à 40A



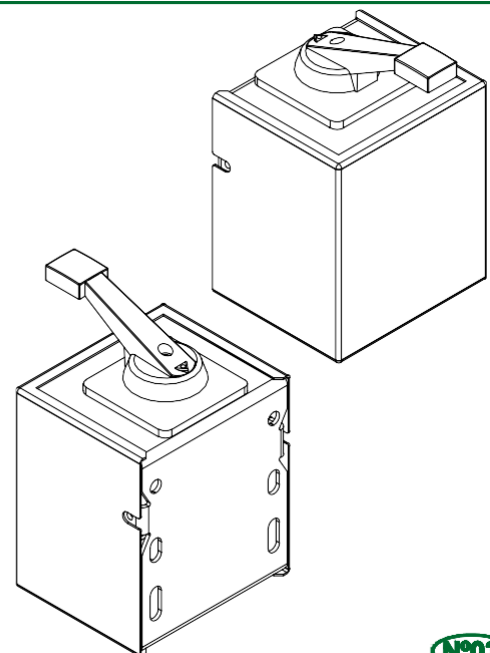
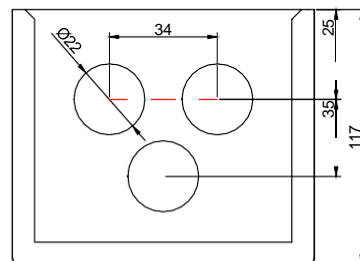
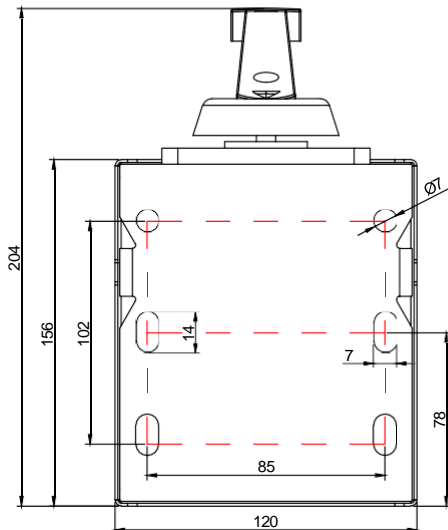
N°01

**Line TRG-DV-ETR-DH-MR127-PSP**  
Chain: 15 à 40A



N°02

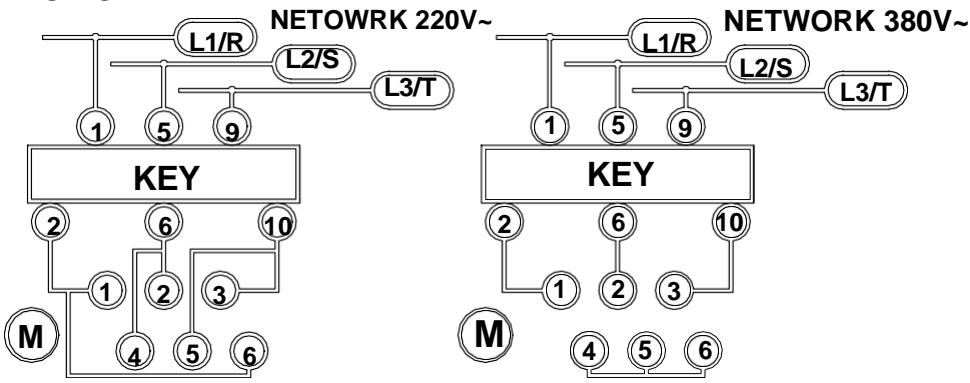
**Line LD-LDL-R-RR-MLD-MR**  
**TRG-DV-ETR-DH-PSP-MDV**  
Chain: 60 e 90A



N°03

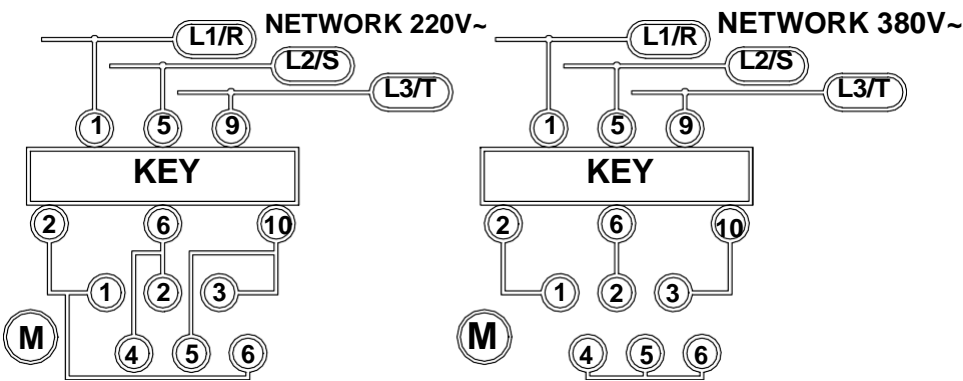
# ELECTRICAL DIAGRAM

## On-Off:



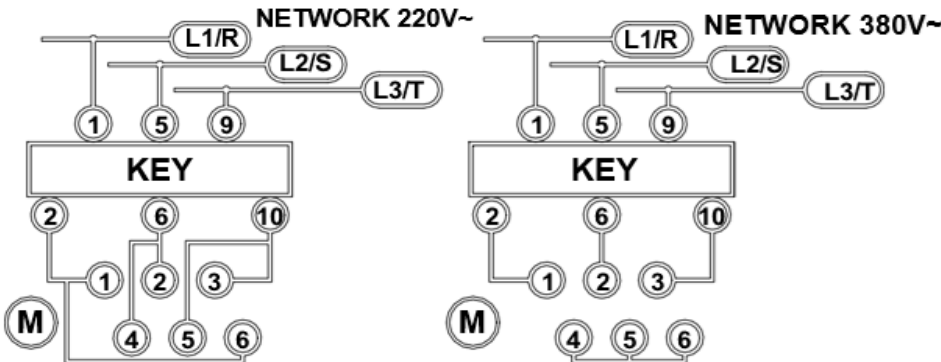
	L1	L2	L3
LD	1	5	9
Off On.			
	2	6	10
	T1	T2	T3
0° Off			
45° On	X	X	X

## On-Off-On:



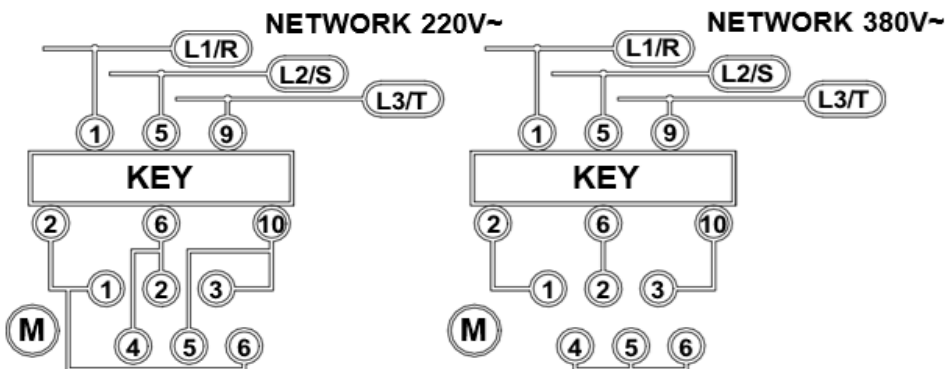
	L1	L2	L3
LDL	1	5	9
On. Off On.			
	2	6	10
	T1	T2	T3
-45° On	X	X	X
0° Off			
45° On	X	X	X

## Reverse:



	L1	L2	L3
R	1	5	9
I Off II			
	2	6	10
	T1	T2	T3
-45° I		X	X
0° Off			
45° II	X	X	X

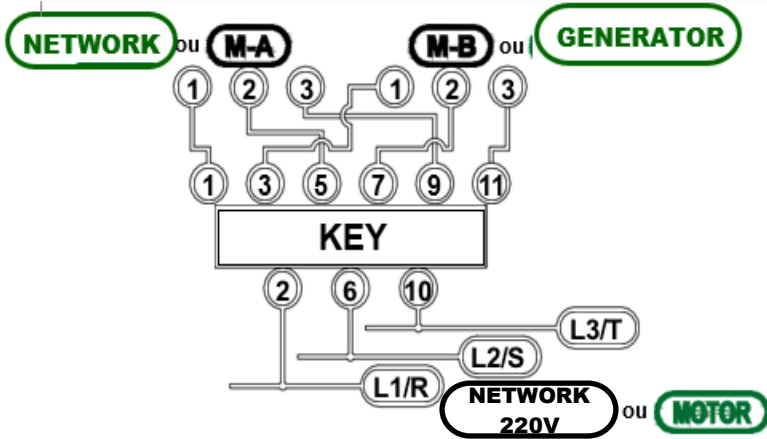
## Reverser with return



	L1	L2	L3
RR	1	5	9
⇒ Off ⇐			
	2	6	10
	T1	T2	T3
-30° I		X	X
0° Off			
30° II	X	X	X

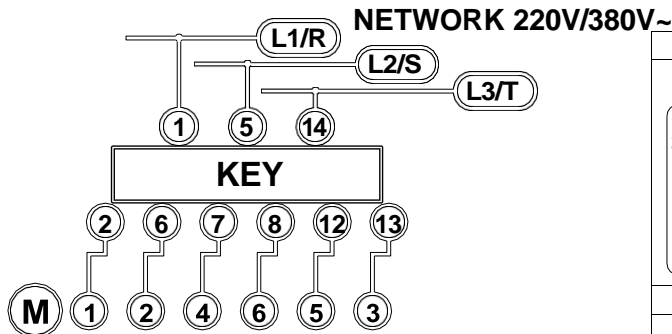
# ELECTRICAL DIAGRAM

## Network-Generator Transfer



	T1A	T1B	T2A	T2B	T3A	T3B
TRG	1   3	5   7	9   11			
Off	[Circuit diagram showing all switches open]					
	2   4	6   8	10   12			
	L1	L2	L3			
-45° I		X	X	X		
0° Off						
45° II	X	X	X			

## Dual Voltage

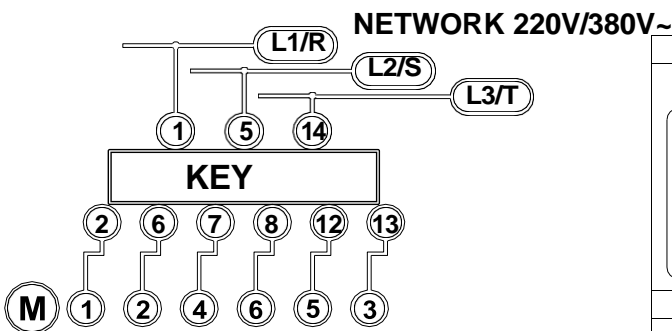


6-wire motor with 220/380 winding - Operating voltage 220V~						
6-wire motor with 380/660 winding - Operating voltage 380V~						
Motor:	1	2	3	4	5	6
Key:	2	6	13	7	12	8

12-wire motor with 220/380/440/760 winding - Voltage 220V~						
Motor:	1-7	2-8	3-9	4-10	5-11	6-12
Key:	2	6	13	7	12	8

	L1	L2	4	3	15
DV	1   3	5   7	9   11	13   15	
380V Off 220V	[Circuit diagram showing switches for 380V and 220V]				
	2   4	6   8	10   12	14   16	
	1	2	6	5	L3
-45° 380V	X	X	X	X	X
0° Off					
45° 220V	X	X	X	X	X

## Star-Triangle



6-wire motor with 220/380 winding - Operating voltage 220V~						
6-wire motor with 380/660 winding - Operating voltage 380V~						
Motor:	1	2	3	4	5	6
Key:	2	6	13	7	12	8

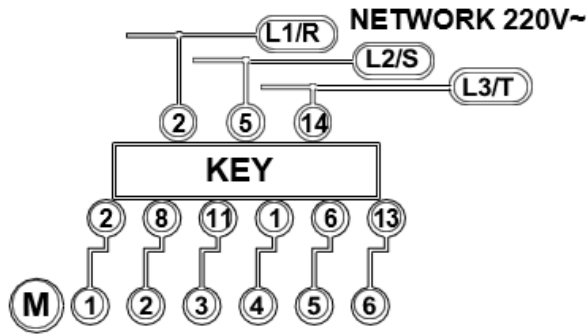
12-wire motor with 220/380/440/760 winding - Voltage 220V~						
Motor:	1-7	2-8	3-9	4-10	5-11	6-12
Key:	2	6	13	7	12	8

12-wire motor with winding 220/380/440/760 - Voltage 440V~						
Motor:	1	2	3	10	11	12 (Isolate4-7 Isolate5-8 Isolate6-9)
Key:	2	6	13	7	12	8

	L1	L2	4	3	15
ETR	1   3	5   7	9   11	13   15	
Y → 0	[Circuit diagram showing Star and Triangle connections]				
	2   4	6   8	10   12	14   16	
	1	2	6	5	L3
-30° Y	X	X	X	X	X
0° Off					
90° Δ	X	X	X	X	X

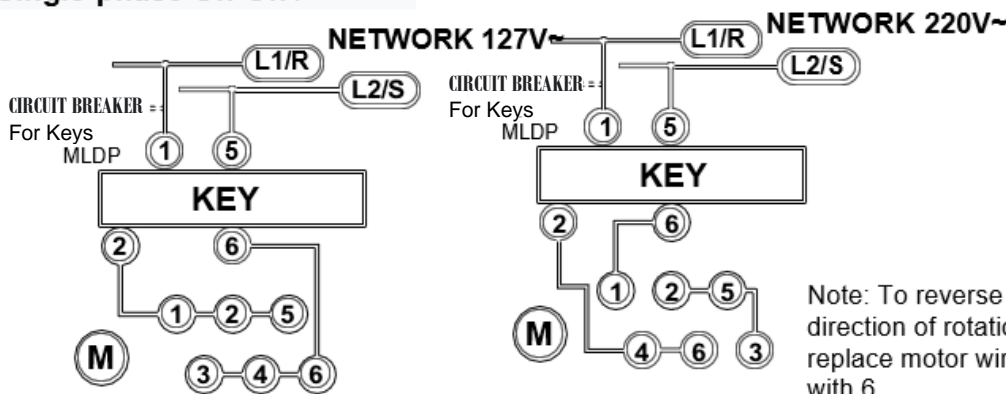
# ELECTRICAL DIAGRAM

## Dual Polarity



		4	1	L2	4	9	3	13	15
DH	Off	1	3	5	7	9	11	13	15
Alta	Baixa								
		2	4	6	8	10	12	14	16
		L1		5	2			L3	6
-45°	High		X			X			X
0°	Off								
45°	Low	X		X	X		X	X	

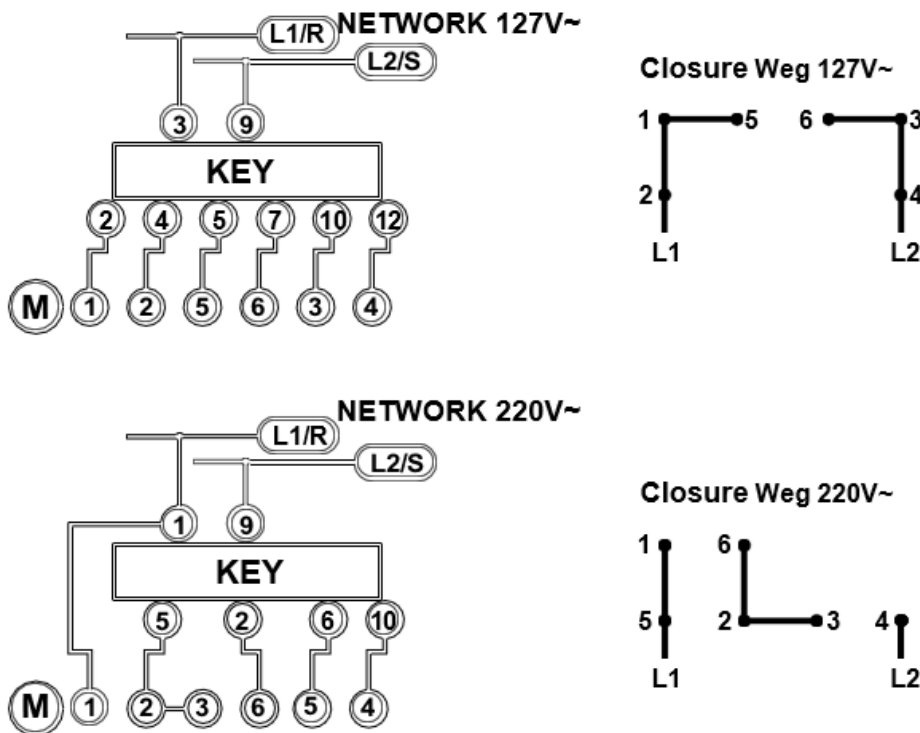
## Single-phase On-Off:



		L1	L2
MLD	Off	1	5
On			
		2	6
		T1	T2
0°	Off		
45°	On	X	X

Note: To reverse the direction of rotation, replace motor wire 5 with 6.

## Single-Phase Reverser:



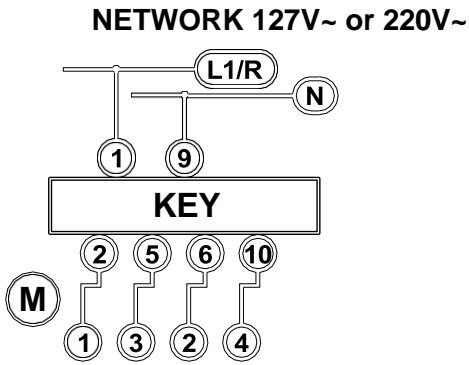
		L1	5	6	L2		
MR127V	Off	1	3	5	7	9	11
I	II						
		2	4	6	8	10	12
		1	2			3	4
-45°	I	X	X			X	X
0°	Off						
45°	II		X	X	X	X	

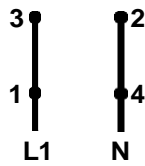
		L1/1	2/3	L2	
MR220V	Off	1	5	9	
I	II				
		2	6	10	
		6	5	4	
-45°	I		X	X	X
0°	Off				
45°	II	X	X	X	

# ELECTRICAL DIAGRAM

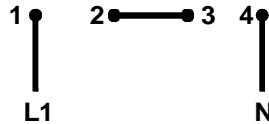
## Single Phase Dual Voltage



### Network 127V~

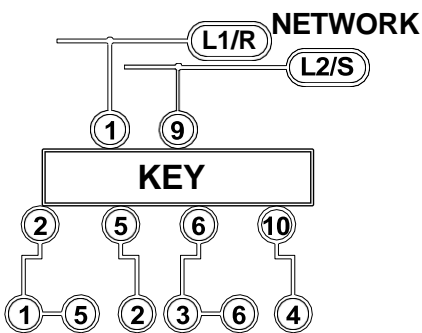


### Network 220V~

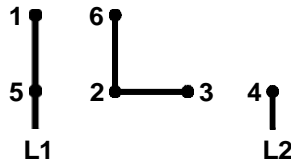


	L1	3	N	
MDV	1	3	5	7
127V Off 220V	2	4	6	8
	1	2	4	
-45° 127V	X	X		X
0° Off				
45° 220V	X		X	X

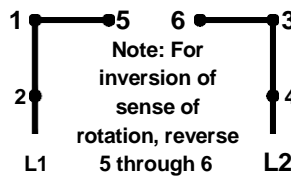
## Series/Parallel Match:



### Series Match 220V~



### Working in Parallel 127V~



	L1	2	L2	
PSP	1	3	5	7
PT → 0 TB	2	4	6	8
	1/5	3/6	4	
-30° PT	X	X		X
0° Off				
90° TB	X	X		X

# OVERLAY WRENCHES FOR ENGINE

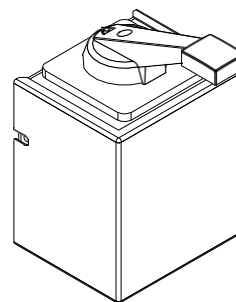
## HOW TO REQUEST YOUR KEY

Codification:

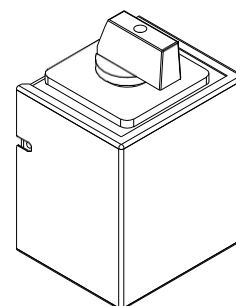
Model	Chain	Trigger
LD	15	P
LDL	20	K
R	30	
RR	40	
TRG	60	
DV	90	
ETR		
DH		
MLD		
MLDP		
MR127 ou MR220		
MDV		
PP		

Note:

- For tetrapolar models, consult a seller;
- For single-phase inverter, specify working voltage.



Model with type trigger "P"



Model with type trigger "K"

### NHTES Disconnecter Switch - Under Load



### Other THS Products

#### DPS Line 175 and 275



#### Rotary Line and Overlay Wrenches



#### TCF Line and Buttons



#### Disconnecter Line 10A to 1600A



#### Transfer Disconnecter Line 10A to 1600A



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