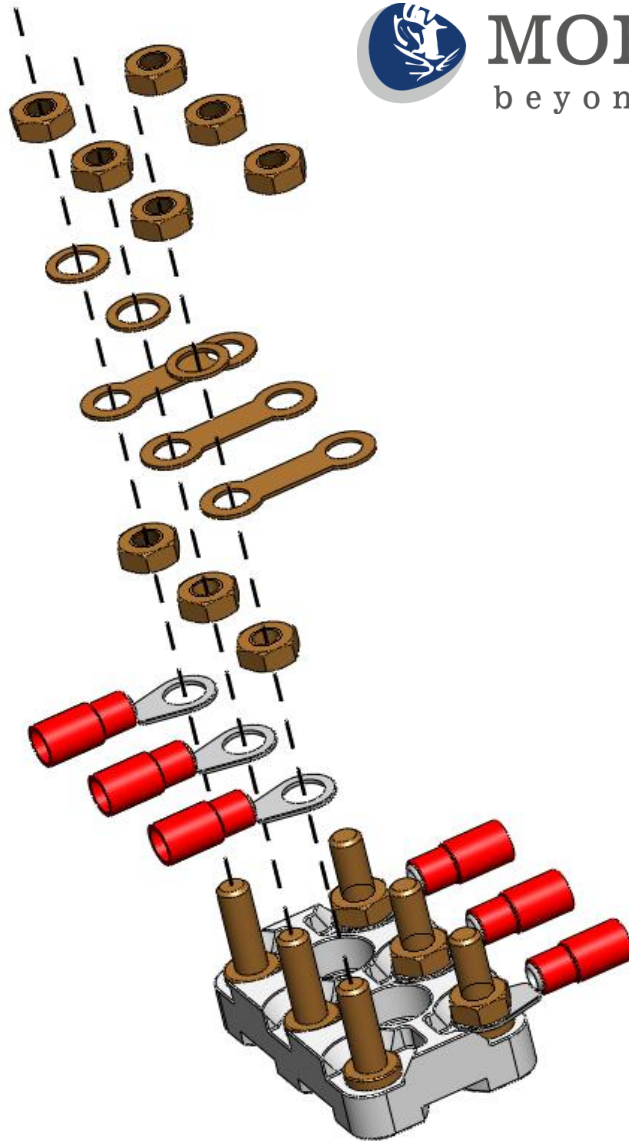




**MORATTO**  
beyond energy



## CONNECTION DIAGRAMS

Six inserts terminal blocks for:

- single-phase motors
- single-phase motors with electronic capacitor
- two-phase motors
- single speed - three phase motors
- two speed, single winding - three phase motors
- two speed, double winding - three phase motors
- three speed, three phase motors

supplied without the brake.

### Main purpose

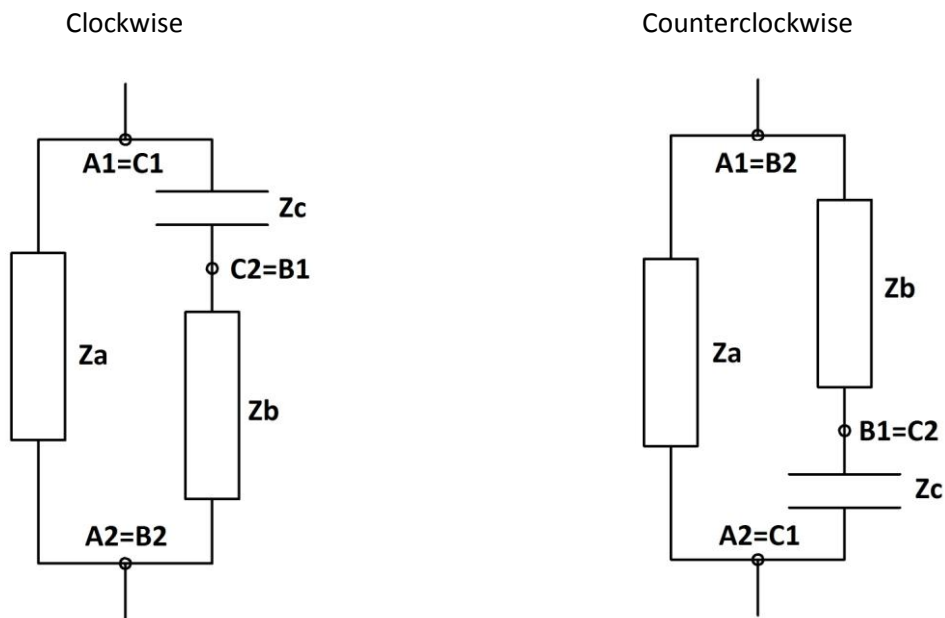
This brochure sets the standards to connect both the terminal ends of the windings and the supply cables in the terminal blocks.

# SINGLE-PHASE MOTORS

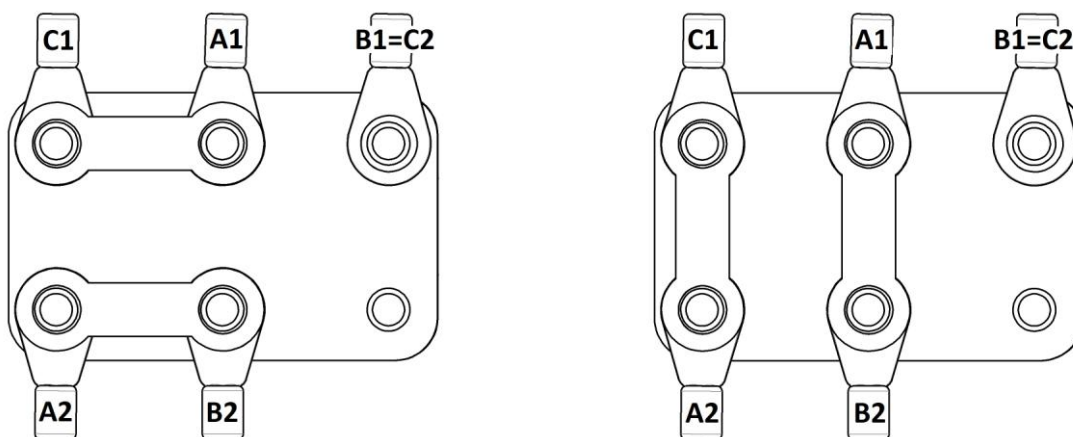
The winding consists of 2 phases (Za and Zb) with a run capacitor (Zc).

These 3 items have 2 ends each: A1, A2 for Za, B1, B2 for Zb, C1, C2 for Zc.

There are 2 ways to connect the 6 ends, according to the sense of rotation:



End terminals and plaques are placed as in the drawings below:



The nameplate voltage has to be supplied between A1 and A2.

## Notes:

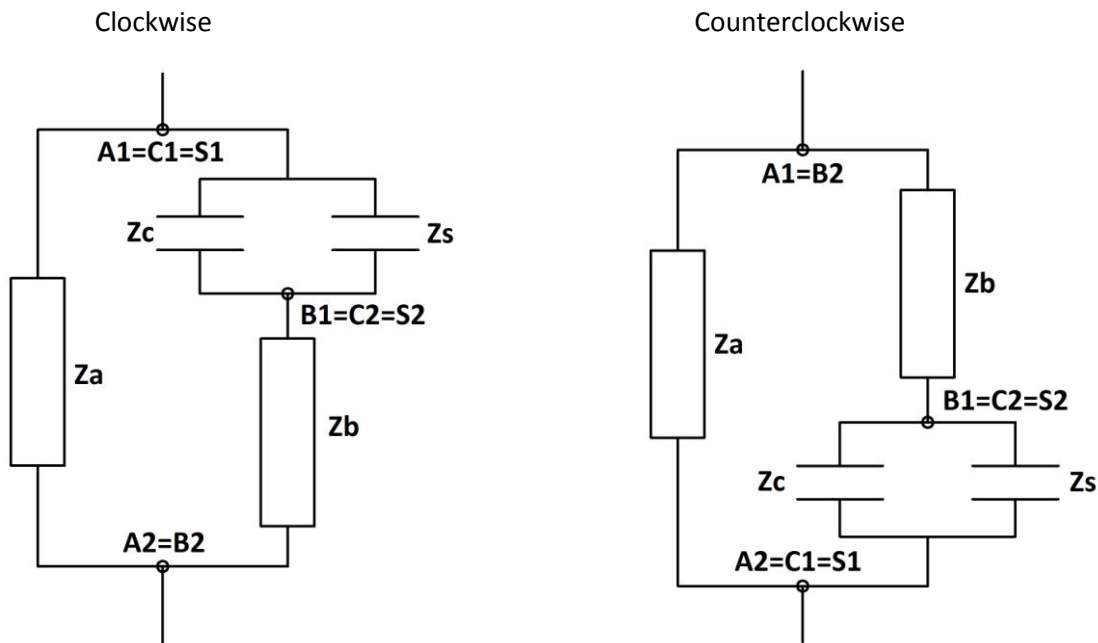
- The sense of rotation is referred to the motor seen from the shaft side.
- The terminal block is seen keeping the shaft of the motor to its left.

## SINGLE-PHASE MOTORS with electronic capacitor

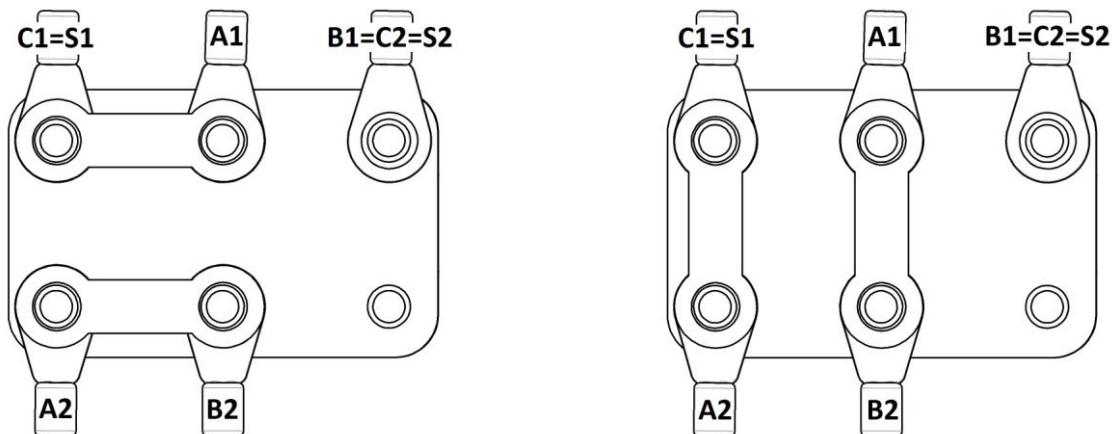
The winding consists of 2 phases (Za e Zb), with a run capacitor (Zc) and an electronic capacitor (Zs).

These 4 items have 2 ends each: A1, A2 for Za, B1, B2 for Zb, C1, C2 for Zc, S1, S2 for Zs.

There are 2 ways to connect the 8 ends, according to the sense of rotation:



End terminals and plaques are placed as in the drawings below:



The nameplate voltage has to be supplied between A1 and A2.

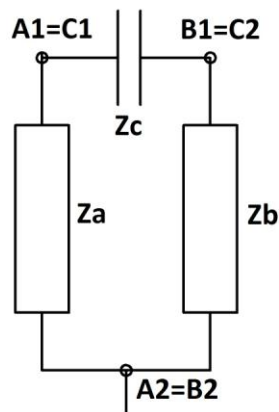
### Notes:

- The sense of rotation is referred to the motor seen from the shaft side.
- The terminal block is seen keeping the shaft of the motor to its left.

## TWO-PHASE MOTORS

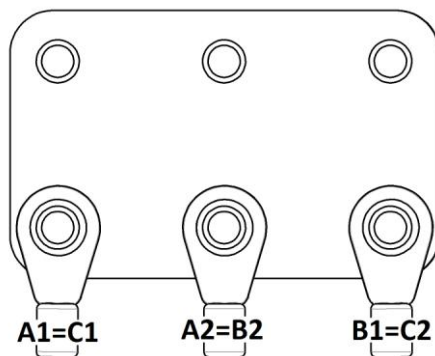
The winding consists of 2 phases (Za and Zb) with a capacitor (Zc).

These 3 items have 2 ends each: A1, A2 for Za, B1, B2 for Zb, C1, C2 for Zc.



The connection between A2 and B2 is made within the motor.

End terminals are placed as in the drawings below:



The nameplate voltage has to be supplied between A2 and B1 or between A2 and A1 if you want to reverse the sense of rotation.

### Notes:

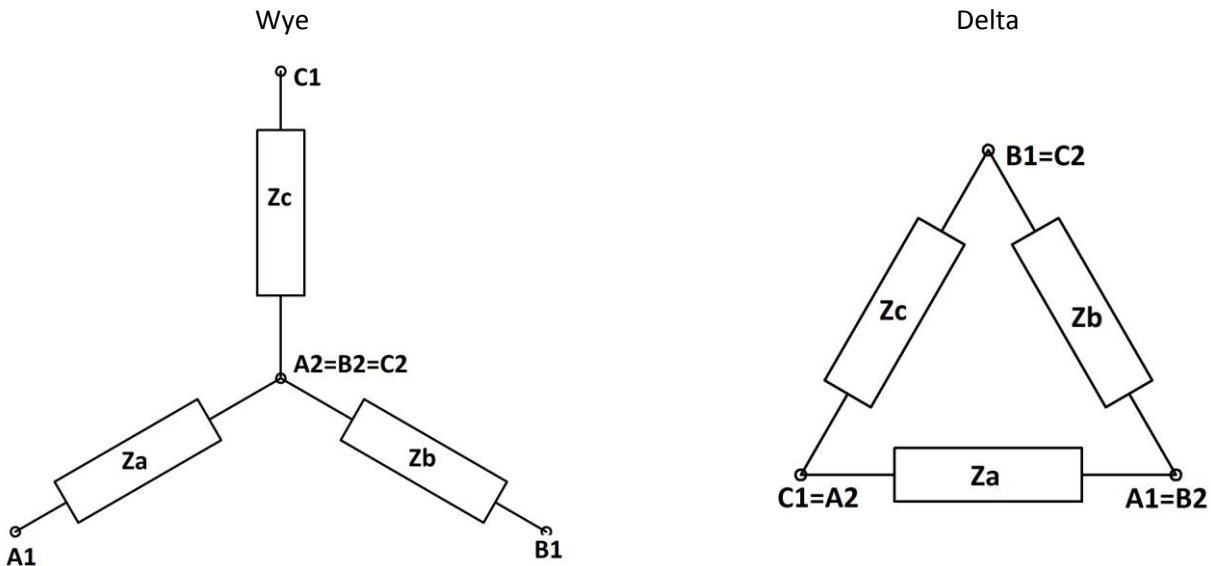
- The terminal block is seen keeping the shaft of the motor to its left.

# SINGLE SPEED - THREE PHASE MOTORS

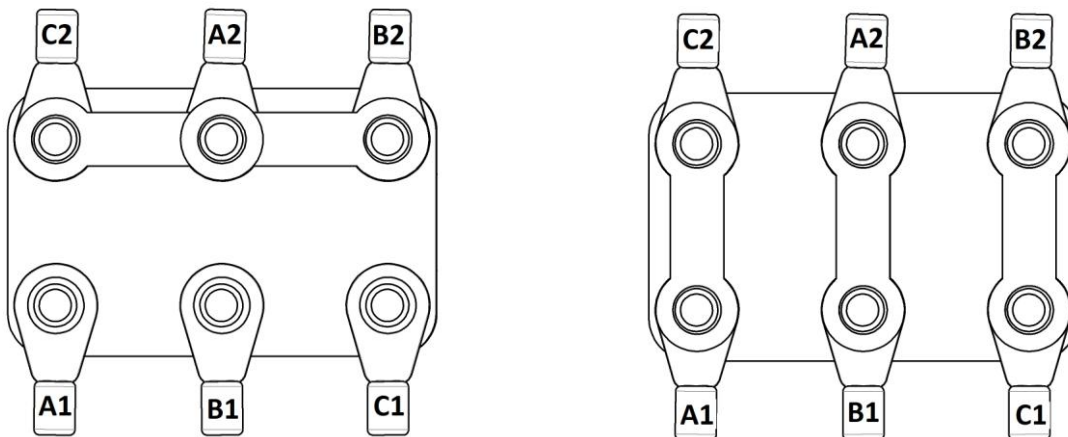
The winding consists of 3 phases (Za, Zb e Zc).

These 3 items have 2 ends each: A1, A2 for Za, B1, B2 for Zb, C1, C2 for Zc.

There are 2 ways to connect the 6 ends, according to the voltage available:



End terminals and plaques are placed as in the drawings below:



The nameplate voltage shall be supplied between A1,B1 and C1.

In case of Wye connection the supply voltage shall be the higher between the two in the nameplate.

In case of Delta connection the supply voltage shall be the lower between the two in the nameplate.

## Notes:

- To reverse the sense of rotation you have to reverse the position of any 2 supply cables.
- Wye connection supply voltage is  $\sqrt{3}$  times greater than delta connection supply voltage. Current in the second case will be  $\sqrt{3}$  times higher than in the first case. In both cases input and output are the same.
- The terminal block is seen keeping the shaft of the motor to its left.

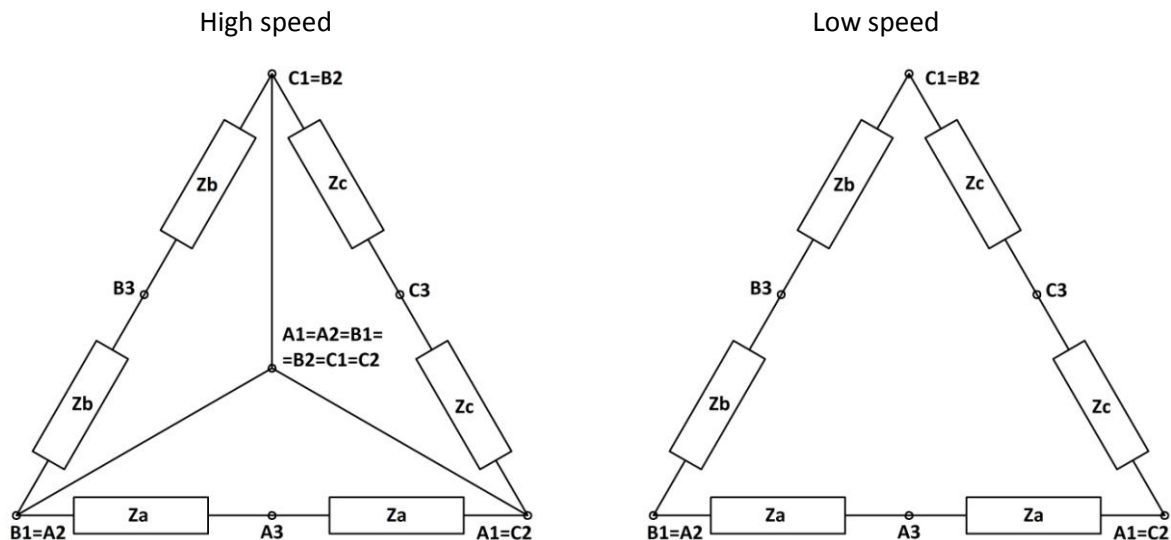
# TWO SPEED Δ/YY SINGLE WINDING - THREE PHASE MOTORS

The winding consists of 3 phases (Za, Zb e Zc).

These 3 items have 2 ends each and 1 intermediate derivation:

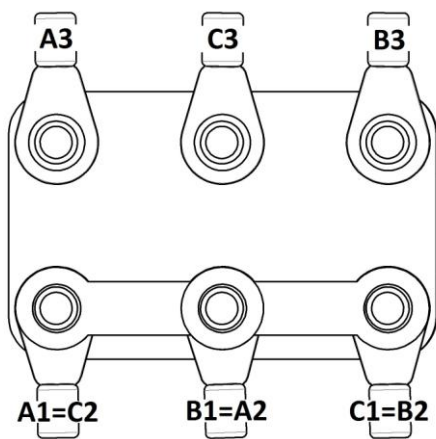
A1, A2, A3 for Za, B1, B2, B3 for Zb, C1, C2, C3 for Zc.

There are 2 ways to connect the 6 ends, according to the speed required:

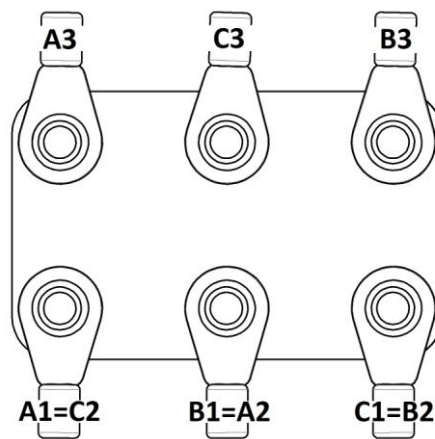


As the ends of the 3 phases are connected within the motor, you find 6 terminals.

End terminals and plaques are placed as in the drawings below:



The nameplate voltage shall be supplied between A3, B3 and C3.



The nameplate voltage shall be supplied between A1=C2, B1=A2 and C1=B2.

## Notes:

- To reverse the sense of rotation of both speeds you have to reverse the position of any 2 supply cables.
- In order to keep the sense of rotation of the motor in both speeds you have to translate the supply cables between A1=C2, B1=A2, C1=B2 and A3, B3, C3 avoiding to invert them.
- The terminal block is seen keeping the shaft of the motor to its left.

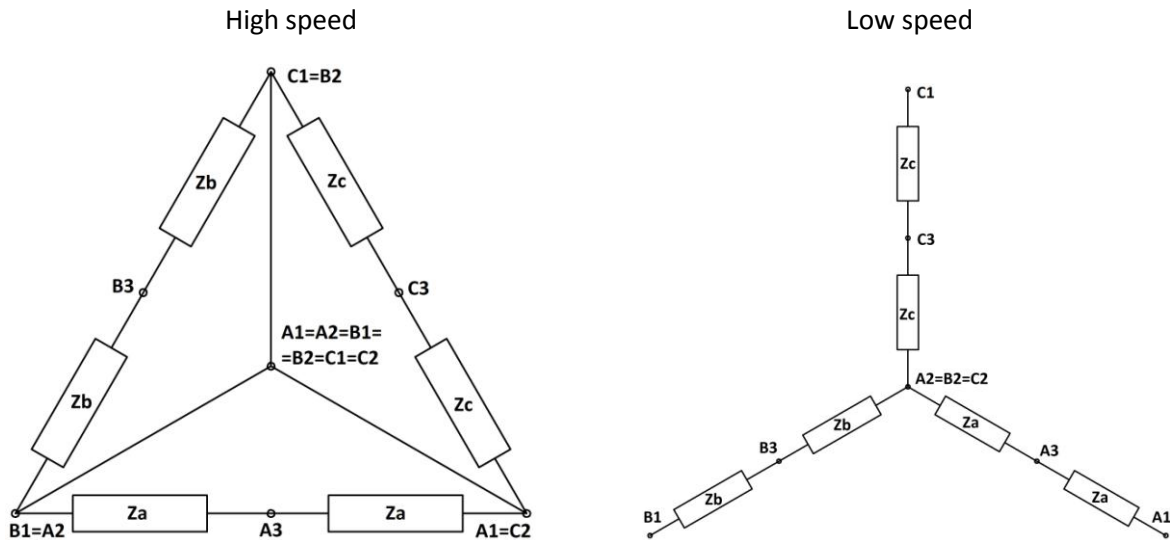
# TWO SPEED Y/YY, SINGLE WINDING - THREE PHASE MOTORS

The winding consists of 3 phases (Za, Zb e Zc).

These 3 items have 2 ends each and 1 intermediate derivation:

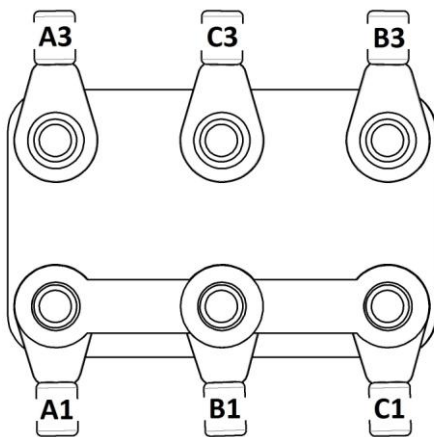
A1, A2, A3 for Za, B1, B2, B3 for Zb, C1, C2, C3 for Zc.

There are 2 ways to connect the 6 ends, according to the speed required:

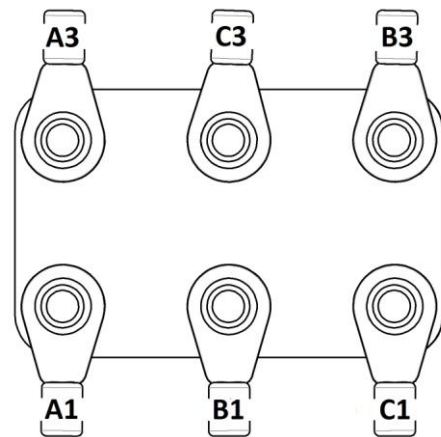


As the ends of the 3 phases are connected within the motor, you find 6 terminals.

End terminals and plaques are placed as in the drawings below:



The nameplate voltage shall be supplied between A3, B3 and C3.



The nameplate voltage shall be supplied between A1, B1 and C1.

## Notes:

- To reverse the sense of rotation of both speeds you have to reverse the position of any 2 supply cables.
- In order to keep the sense of rotation of the motor in both speeds you have to translate the supply cables between A1, B1, C1 and A3, B3, C3 avoiding to invert them.
- The terminal block is seen keeping the shaft of the motor to its left.



## TWO SPEED, DOUBLE WINDING - THREE PHASE MOTORS

The motor consists of 2 windings.

Low speed winding consists of 3 phases (Za, Zb e Zc).

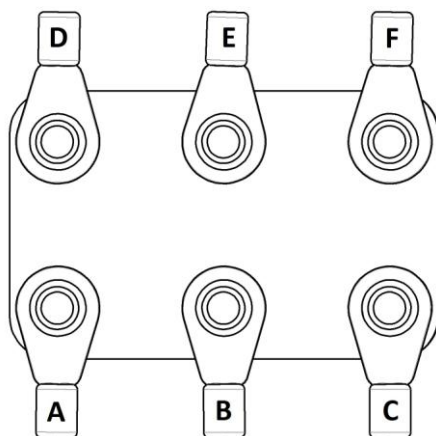
These 3 items have 2 ends each: 3 of these terminals (one for each phase) are interconnected within the motor, for this reason you find 3 terminals, one for each phase: A for Za, B for Zb, C for Zc.

High speed winding consists of 3 phases (Zd, Ze e Zf).

These 3 items have 2 ends each: 3 of these terminals (one for each phase) are interconnected within the motor, for this reason you find 3 terminals, one for each phase: D for Zd, E for Ze, F for Zf.

The 6 terminals of the 2 windings must not be connected to each other in any case.

End terminals are placed as in the drawings below:



The nameplate voltage has to be supplied between A,B and C in case of low speed.

The nameplate voltage has to be supplied between D,E and F in case of high speed.

### Notes:

- In order to keep the sense of rotation of the motor in both speeds you have to translate the supply cables between A, B, C and D, E, F avoiding to invert them.
- To reverse the sense of rotation of one speed you have to reverse the position of any 2 supply cables.
- The terminal block is seen keeping the shaft of the motor to its left.



## THREE SPEED - THREE PHASE MOTORS

The motor consists of 2 windings.

The winding that provides high and medium speed is two speed  $n/2n$  or  $n/6$ , single winding type.  
The winding that provides low speed is single speed type.

These motors are supplied already wired, without terminal box.

2 cables come out of the motor:

one with 7 contacts numbered, 1-6 connected to the Dahlander winding, the 7th for grounding

one with 4 contacts, 3 connected to the three-phase single speed winding, one for grounding.

For the diagrams of two windings, see the previous cards.

Summing up:

to get high speed you have to supply 4,5,6 and short-circuit contacts 1,2,3 of the cable with 7 contacts

to get the medium speed you have to supply 1,2,3 and hold open contacts 4,5,6 of the cable with 7 contacts

to get the low speed you have to supply the three contacts of the cable with 4 contacts.

### Notes:

- In order to keep the sense of rotation of the motor in both high speeds you have to translate the supply cables between 1,2,3 and 4,5,6 avoiding to invert them.
- To reverse the sense of rotation of each speed you have to reverse the position of any 2 supply cables.
- You cannot choose between star and delta connection in the three-phase single speed winding

## TIGHTENING TORQUE

| Insert | Spanner number | Tightening torque [Nm] |       |     |
|--------|----------------|------------------------|-------|-----|
|        |                | min                    | rated | max |
| M4     | 7              | 1,8                    | 2,0   | 2,2 |
| M5     | 8              | 2,7                    | 3,0   | 3,3 |
| M6     | 10             | 3,6                    | 4,0   | 4,4 |
| M8     | 13             | 4,5                    | 5,0   | 5,5 |

## SEQUENCE OF ITEMS

Along an insert, from the base to the top, you may find:

1. Eyelet of a phase terminal
2. Nut
3. Washer and/or plaque
4. Nut

The eyelets of supply cables have to be placed between 3. and 4. as in the drawing below:

