SIEMENS

Operating Instructions

Automatic Star-Delta Starter Extended Range (75kW-132kW)

3TE05..-2AR0

IS/IEC 60947-4-1

Rating	MLFB
75kW	3TE05 94-2AR0
90kW	3TE05 95-2AR0
110kW	3TE05 96-2AR0
132kW	3TE05 97-2AR0

Please read and understand these instructions before installating, operating, or maintaining the equipment.
Keep for future reference

Danger
Hazardous voltage can cause death or serious injury.
Disconnect power before working on equipment.

Warning
Automatic Motor Restart.
Can cause death, serious injury or property damage.

Do not use automatic reset mode when unexpected automatic restart of the motor can cause injury to persons or damage to equipment.

Reliable functioning of the equipment is only ensured with certified components. Commissioning and maintenance by qualified personnel only.

NOTICE
This product has been designed for environment A. Use of this product in environment B may cause unwanted electromagnetic disturbances in which case the user may require to take adequate mitigation measures.

Technical Data

Enclosed Automatic Star delta Starter which is the combination of 3TF Contactors, 3UA relay and 3RP Timer with no derating upto +55°C, provides overload, single phasing protection for three phase motors and IP54 for Enclosure.

1. **Operating Voltage –** 415V ac
2. **Rated Insulation Voltage –**
   Main circuit : 690V
   Auxiliary circuit : 690V
3. **Rated Impulse Voltage –**
   Main circuit : 8kV
   Auxiliary circuit : 6kV
4. **Coil Voltage –** 415V ac
5. **Permissible ambient temperature –**
   Operation : -5 to 40 °C
   Temperature compensation : Upto 40 °C
6. **Frequency –** 50 Hz
7. **IP Protection –** IP 54
8. **Cable incoming from Supply –**
   Top & Bottom both provisions
9. **Cable outgoing to Motor –** Bottom
10. **Locking –** Middle lock with key

Installation

1. Enclosed Starter 3TE05 are Wall mounting type. Care should be taken to avoid shocks and prolonged vibrations.
2. Refer figure 8 for the mounting dimensions and figure 4 for permissible mounted angle.
3. "Mount on a plane surface by 4 x M10 bolts/studs, secured by nuts with plain and spring washers."
4. Depending upon location of incoming and outgoing cables remove corresponding rubber Grommets. Ensure dust-proofing by using proper cable glands.

5 Select Correct Size of Cables as specified in selection Table 1. Remove required length of insulation and using the hardware specified (refer table 2) at the connection terminals, fix the incoming and outgoing cables. Tighten the screws firmly.

6 Check that line and motor connections are done as per wiring diagram (Figure 7) which is also pasted inside the door.

7 Remove any wire cutting fallen into the Starter.

8 Connect Earthing conductor to terminals marked ⏚

Commissioning

1. Open the door by unlocking the locks
2. Before switching ON, re-check external connections.
3. Set Overload relay to 0.58 times the rated motor current.
4. Set the dial of the Timer to an approx. value of starting time of Motor (preferably more than 6 secs)

A. Star-delta Timer setting

1. First Start the motor by pressing Green push button, marked "I"
2. Measure time taken for it to reach nearly rated speed or steady state current (indicated when motor hum reaches a steady pitch)
3. Stop the Motor, set Timer to this measured value, by rotating the Timer dial.

B. Relay Settings

1. For Closer protection set the Overload Relay to the phase current as measured by an ammeter.
2. In absence of Ammeter, use procedure as given below:
   a) Start the motor and let it run for half an hour. Then gradually reduce relay setting till it trips. Set Relay at a slightly higher value of this setting.
   b) Allow reset time of approx. 4 min. Press the blue knob on the relay completely to reset the relay.
   c) Re-start motor after some time. If the relay does not trip, consider it to be properly set. If it trips follow step b with setting at little higher value and recheck.
   d) Overload relay characteristics given below can be used to estimate the average tripping time at different multiples of set current.

Caution:

1. Switch OFF the Starter, and disconnect the main supply by switching OFF the main switch before doing any maintenance.
2. Under No Circumstances should the Relay be set higher than phase current i.e.. 0.58 times the rated current on the motor nameplate.
3. If the Relay trip even when set at the rated Motor current, the suitability of the starter or relay for the particular application should be checked with the nearest Siemens office.
4. Refer Table 1 for the Motor current corresponding to the Motor rating.

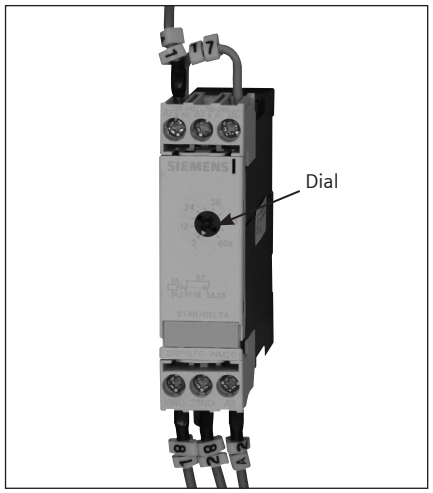


Figure 2: Timer Adjustment

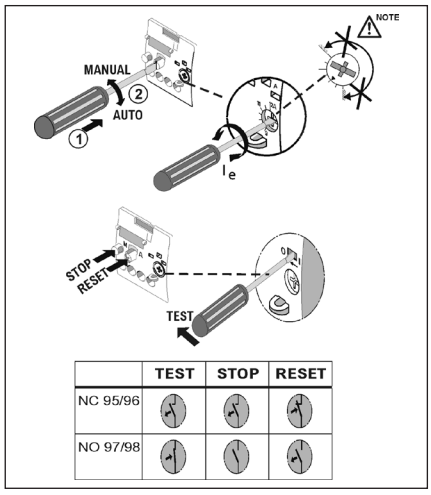


Figure 3: Relay setting Adjustment

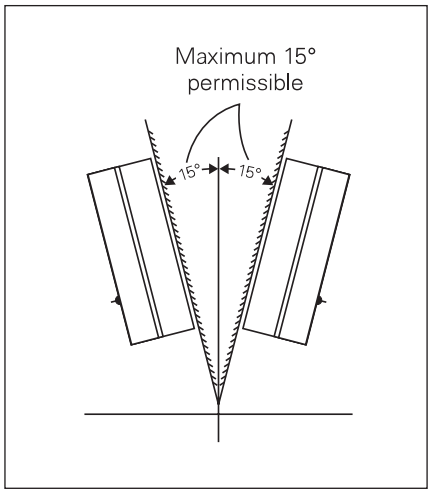


Figure 4: Maximum permissible angle from vertical plane

Table 1: Technical Details

Motor Rating at 415V, 3ph, 50Hz		Motor Current		"Type (ASD)"	Contactor	Contactor	Birelay (Inbuilt)		Recommend-ed Max. Back-up HRC Fuse rating SIEMENS make type 3NA	Recommended Cu Cable with lugs in sq. mm	
		Line current	Phase current	MLFB	Delta/Main	Star				Incoming	Outgoing
HP	kW	I_L(A)	I_{ph} (A)		3TF	3TF	Relay Range	Type		From Supply	To Motor
100	75	131	75.6	3TE05 94-2AR0	3TF49	3TF47	70-95A	3UA5800-8YZ1	160	50	25
125	90	156	90	3TE05 95-2AR0	3TF50	3TF47	70-95A	3UA5830-5B	160	70	35
150	110	189	109	3TE05 96-2AR0	3TF50	3TF50	95-120A	3UA5830-5D	200	95	35
180	132	227	132	3TE05 97-2AR0	3TF51	3TF50	115-180A	3UA6230-5B	250	120	50

* For Type-2 co-ordination chart, refer latest Price list of " LV switchgear - Motor control products"

Trip Curve

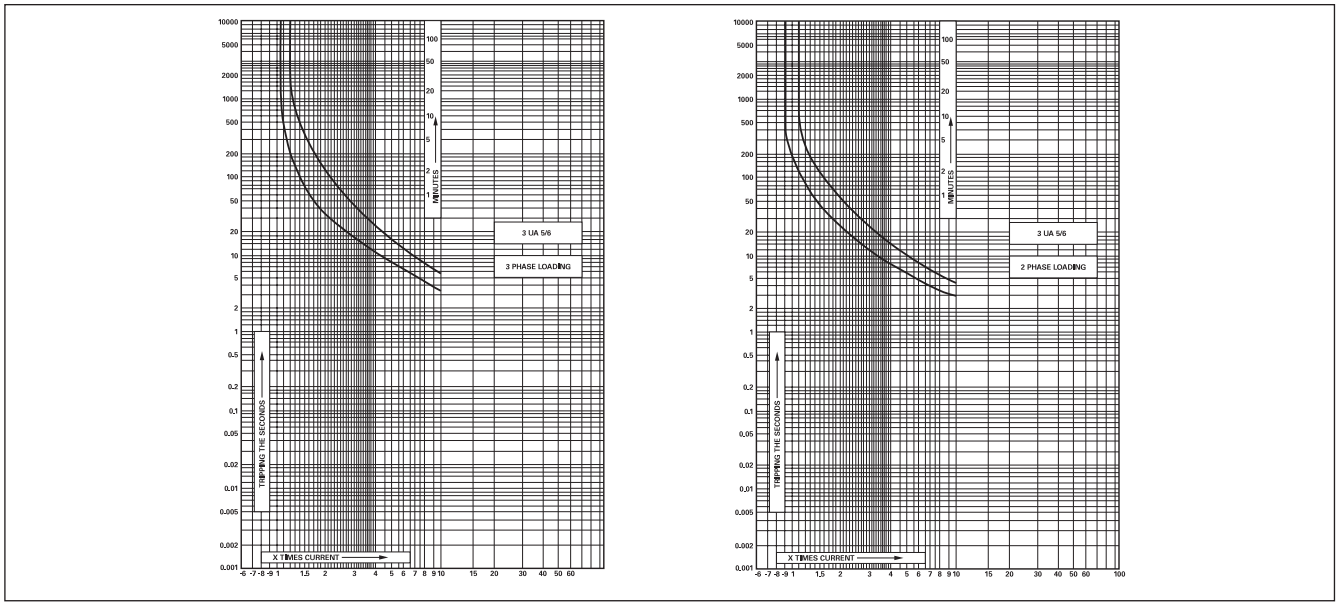
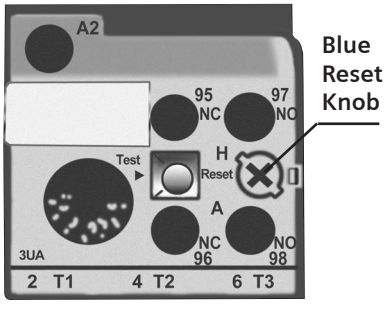


Figure 5: Operating Charateristics of 3UA5/6 Relays

Operation

1. For Starting the Motor, press Green push button, marked "I"
2. For Stopping the Motor, press Red push button, marked "O"
3. For Relay Reset: First switch off the Starter, open the door and then press blue push button, marked "Reset", for resetting, after the relay has tripped due to overload.
4. In case if you want the Starter in "Self Reset" mode, the blue knob on Relay is to be pressed and rotated in anticlockwise direction, so that it comes in position "A" and its edge flush with the relay surface. In this mode if the relay trips on overload, it will be automatically reset in maximum 4 minutes.

   The Motor can be restarted only after the relay is reset.



H - Hand Reset
A - Auto Reset

Figure 6: Relay Front View

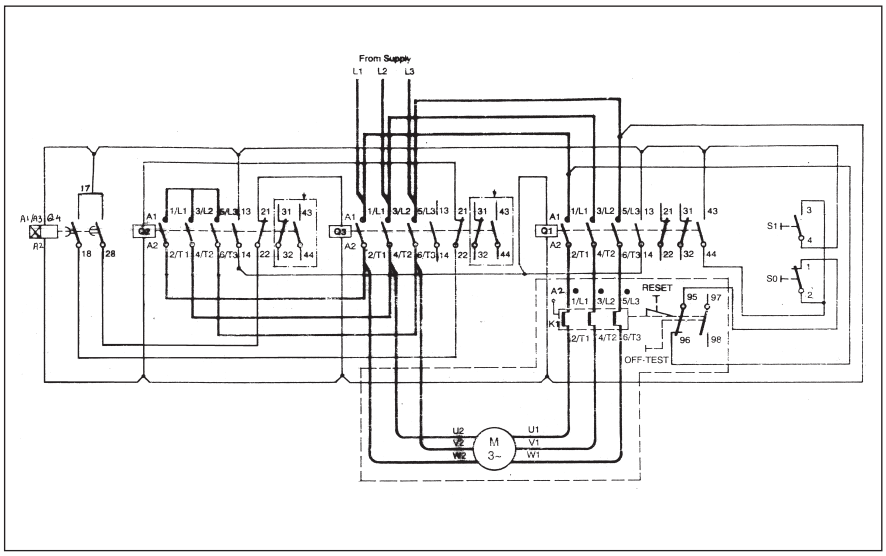


Figure 7: Wiring Diagram

Q1 : Line Contactor

Q2 : Star Contactor

Q3 : Delta Contactor

S1 : 'ON' Push Button-I

S0 : 'OFF' Push Button-O

S4 : 'Reset' Button (of relay)

K1 : Bimetal Relay

Q4 : Star Delta Timer

Maintenance

1. Keep the interior dust free.
2. Check the tightening of terminal screws time to time.
3. No Maintenance is needed for overload relay and Timer. Do not open them.
4. If the Contactor hums, clean the magnet pole faces with soft cloth.
5. Replace contacts of the contactor if they are severly pitted or when only 40% original contact tip remains.
6. For details of contactor maintenance refer to - "Guide to contactor Installation & Maintenance".

Dimensional Drawings (all dimensions in mm)

3TE05..-2AR0

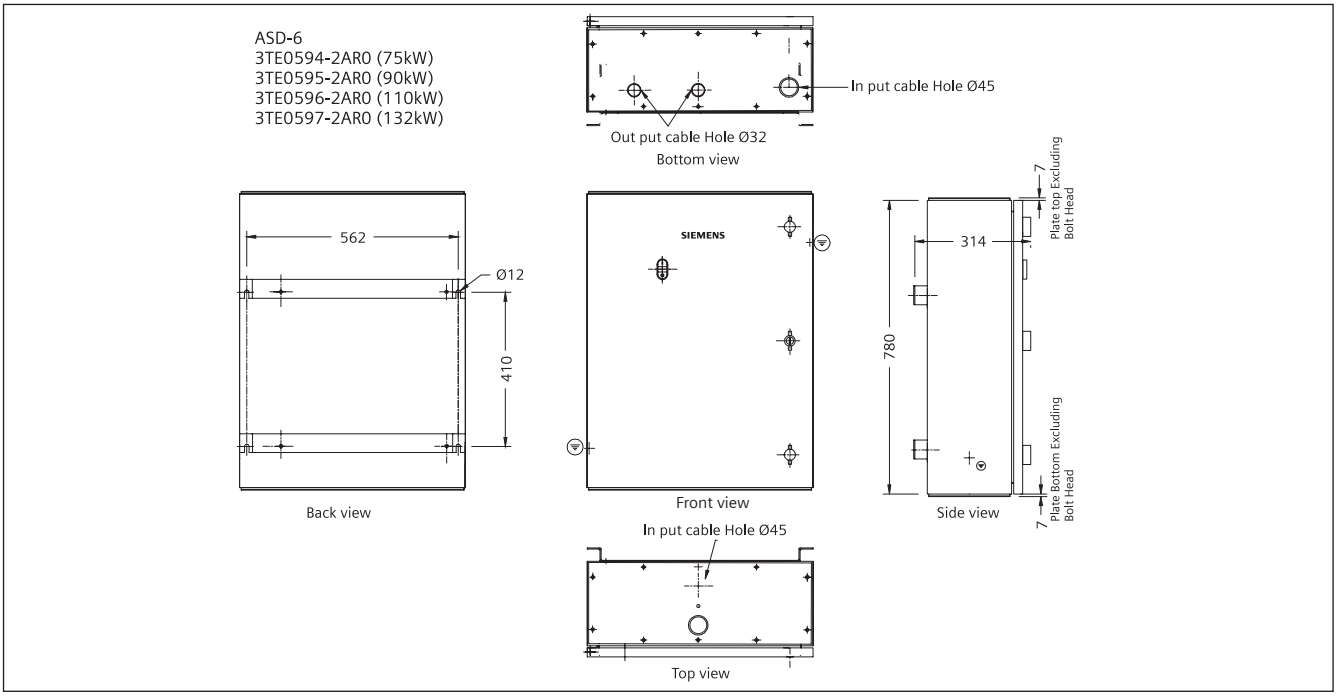


Figure 8: External and Mounting Dimensions

Table 2 : Hardware Information

kW	Incoming Terminals	Outgoing Terminals	Tightening Torque
75	M6	M6	8-10 Nm
90	M6	M6	8-10 Nm
110	M6	M6	8-10 Nm
132	M8	M8	12-16 Nm

Spares List

Spares:		
Type of Spares	**MLFB/Catalogue Number-Make**	**Make**
ON/OFF Actuator	3SB5201-7EC01	Siemens
Electronic Timer	3RP15 76 -1NM20 8K	Siemens
Relay	As per Table 1	Siemens
Lock with key	MS 748-3 with Cam 12mm	Arihant Panel fittings
Lock without key	MS 714-2 with Cam 12mm	Arihant Panel fittings

Disposal

Siemens Products are environment friendly, which predominantly consist of recyclable materials.

For disposal we recommend disassembling and separation into following materials:

METALS : Segregate into Ferrous & Non Ferrous types for recycling through authorised dealer.

PLASTICS : Segregate as per material type for recycling through authorised dealer.

Because of the long lifetime of Siemens products the disposal guidelines may be replaced by other national regulations when taking the product out of service. The local customer care service is available at any time to answer disposal-related questions