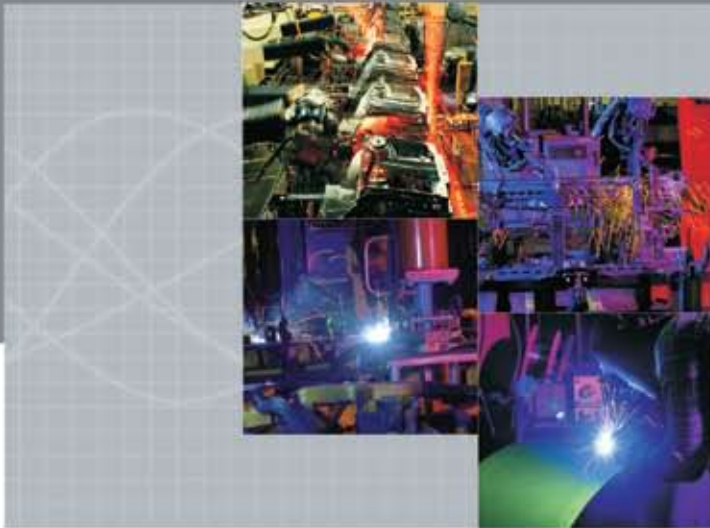


Range of Starters.... for Every Need



CITATION STARTERS



BCH ELECTRIC LIMITED



A Range of Starters

BCH manufactures a wide range of motor starters to suit every application in the field. The capacity starts from fractional horse power to 250 hp completely assembled ready to use units with built in overload and single phasing protection.

Mini Manual Starter (Upto 10 Hp)

Direct-On-Line, manually operated, Mini Starter is designed for non-reversing control of all types of squirrel cage motors with an intermittent duty of 15 starts per hour (utilisation category AC3) complying with performance requirements of IS 8544 Part I. It is capable of switching motors upto 10HP, 415V, 3Phase or 3 HP single phase. The starter unit comprises of a double break, on load switch operated by means of a toggle link mechanism. Adjustable bimetal thermal overload trips are included which can be set to follow closely the heating characteristics of the motor.



Characteristics

Utilisation category	AC 3 as per IEC 292-1 and IS 8544 Part I
Insulation voltage	600V
Thermal rating	20A
Operational current Ie	16A at 415V
Frequency of operation	15 operation per hour
AC3 rating	16A at 415V, 50Hz
Mechanical life	1x10 ⁵ operations
Enclosure category	Sheet steel enclosure to IP 51 as per IS 2147
Terminal capacity	One cable of 6 mm ² or two cables of 4 mm ²

Selection Chart

RECOMMENDED HP (KW)				RELAY RANGE AMPS	CATALOGUE** CODE		RECOMMENDED FUSE (AMPS)
3PHASE 415V		SINGLE PHASE 230V			3 PHASE	1 PHASE	
HP	KW	HP	KW				
				0.23-0.47	AMLE 10	AMLE 10-SP	2
				0.46-0.8	AMLE 20	AMLE 20-SP	2
0.5	0.37	1/6	0.095	0.85-1.55	AMLE 30	AMLE 30-SP	6
0.75	0.52						
1.0	0.75	1/6	0.13	1.60-3.20	AMLE 40	AMLE 40-SP	10
1.5	1.10						
3.0	2.20	0.5	0.37	3.50-6.50	AMLE 50	AMLE 50-SP	20
		0.75	0.52				
5.0	3.70	1.0	0.75	6.80-11.70	AMLE 60	AMLE 60-SP	25
		2.0	1.50				
10	7.5	3.0	2.20	11.00-20.00	AMLE 70	AMLE 70-SP	50

** Substitute E by C for flush mounting.

Citation M Starters

Contactors

The contactors used in starters are NHD and Citation. They are built to IS 13947 and have many distinctive features such as :

- High grade moulding which reduces tracking and prolong operational life.
- Precision ground magnet frame and armature surfaces ensure consistent quiet operation.
- Exposed metals are treated for corrosion resistance.
- Low bounce and weld resistant contacts of silver cadmium oxide.
- Contactors can be inspected and maintained without disturbing adjacent wiring or altering contractor mounting positions.
- Coil is totally encapsulated in resin resisting moisture, corrosive atmosphere and damage while handling.
- Mechanical interlocking is provided between Star and Delta Contactors in case of Starter ratings 40HP and above.



DOL UPTO 30 HP



STAR DELTA UPTO 250 HP



REVERSING DOL UPTO 20 HP

Overload Relay

Overload Protection : The relay fitted in the starter protects the motor from operational overload as per relevant standards established for the protection of motors. The range of current setting on any relay is between 100% to 160% of its minimum setting.

Single Phasing Protection : The relay offers protection against single phasing through its sensitive differential mechanism in excess of the requirements of IS specification 13947-4-1 and trips when it carries in healthy phases 0.9 times the minimum current setting, regardless of the value to which the current adjustment lever is set. Full protection is provided on single phasing under varying operational up to 50% of the full load rating of the motor. No protection is required below this value.

Protection against unbalanced voltage : The relay allows minor imbalance in voltage conditions in the three phases within the limits motors are designed to withstand. Beyond these limits, the relay trips and protects the motor.

- Excellent temperature compensation between -10°C and $+80^{\circ}\text{C}$ ($+55^{\circ}\text{C}$ max. ambient).
- Facility for selection of either manual or automatic resetting of the trip switch.
- Snap-on cover to prevent inadvertent alteration to the setting of current adjustment or to the hand/auto lever.
- Test facility for tripping relay manually for checking of the circuit and wiring.

Automatic Time Delay Relay

The Time Delay Relay used in Automatic Star Delta Starter has superb repeat accuracy, gives satisfactory performance in frequent starting applications. It resets fast and the timing is not affected by variation in ambient temperature and voltage.

Selection Chart - DOL

MOTOR OUTPUT 415V 3 PHASE 50 HZ.		OVERLOAD RELAY RANGE AMPERES	CONTACTOR SIZE	STARTER CATALOGUE CODE	BACKUP PROTECTION HRC FUSE TYPE GII/GL (AMP)
KW	HP				
0.37	0.5	0.72-1.14	00	NADLEN	4
0.55	0.75	1.07-1.7	00	NAELEN	6
0.75	1.0	1.58-2.5	00	NAFLEN	10
1.5	2.0	2.4-3.8	00	NAGLEN	16
2.2	3.0	3.8-6.0	00	NAHLEN	20
3.7	5.0	6.0-9.3	00	NAJLEN	25
5.5	7.5	8.9-13.5	00	NAKLEN	35
7.5	10.0	13.2-20.0	00	NALLEN	50
11.0	15.0	17.4-24.0	0	NAMLEN	63
15.0	20.0	22.0-30.0	1/D	NANLEN	63
18.5	25.00	24.4-39.0	1/D	NACT1LEN	100
22.0	30.0	37.6-60.0	D	NACT2LEDM**	100

* Also available starters for reversing function. For details consult us.

Selection Chart - Star Delta

MOTOR OUTPUT 415V (3 PHASE 50 HZ.)		OVERLOAD RELAY RANGE AMPERES (PHASE CONNECTED)	CONTACTOR SIZE	CATALOGUE CODE		BACKUP PROTECTION HRC FUSE TYPE GII/GL (AMP)
KW	HP			AUTOMATIC STAR DELTA STARTER	SEMI-AUTOMATIC STAR DELTA STARTER	
2.2	3.0	2.4 - 3.8	00	NASAGLEN	NASSGLEN	10
3.7	5.0	3.8 - 6.0	00	NASAHLEN	NASSHLEN	16
5.5	7.5	6.0 - 9.3	00	NASAJLEN	NASSJLEN	20
7.5	10.0	6.0 - 9.3	00	NASAJLEN	NASSJLEN	20
9.3	12.5	8.9 - 13.5	00	NASAKLEN	NASSKLEN	25
11.0	15.0	8.9 - 13.5	00	NASAKLEN	NASSKLEN	32
15.0	20.0	13.2 - 20.0	0	NASALLEN	NASSLLEN	35
18.5	25.0	17.4 - 24.0	0	NASAMLEN	NASSMLLEN	50
22.0	30.0	17.4 - 24.0	0	NASAMLEN	-	50
26.0	35.0	22.0 - 30.0	1	NASANLEN	-	63
30.0	40.0	24.4 - 39.0	D	NASACT1LEDM	-	80
37.0	50.0	37.6 - 60.0	D	NASACT2LEDM	-	80
55.0	75.0	37.6 - 60.0	E	NASACT2LEEM	-	100
67.5	90.0	56.4 - 90.0	E	NASACT3LEEM	-	125
75.0	100.0	56.4 - 90.0	M5	NASACT3LEEC5M	-	160
93.0	125.0	84.6 - 135.0	M5	NASACT4LEEC5M	-	200
110.0	150.0	84.6 - 135.0	M5	NASACT4LEEC5M	-	200
150.0	200.0	131.6 - 210.0	R	NASACT5LEEC6M	-	300
187.0	250.0	131.6 - 210.0	R	NASACT5LEEC6M	-	300

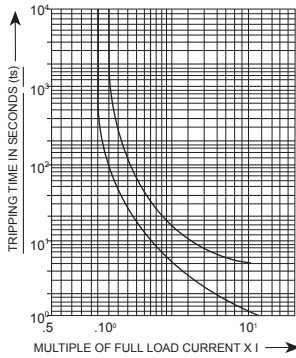
Starters with '00', 0 & 1 contactors have 380/415V coil and D,E & M5 have 415V coil.



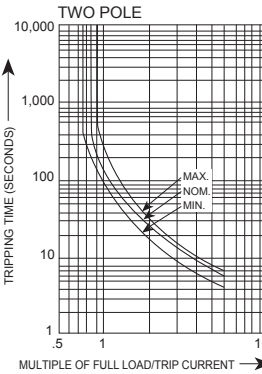
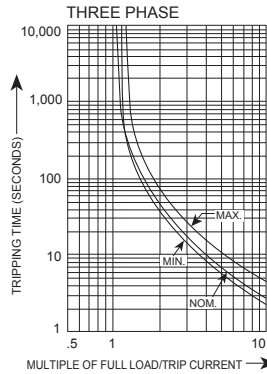
Tripping Characteristics

Direct Operated

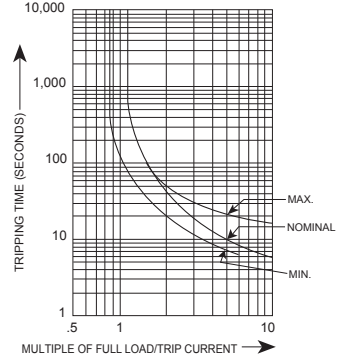
CT Operated



Mini Manual Starter

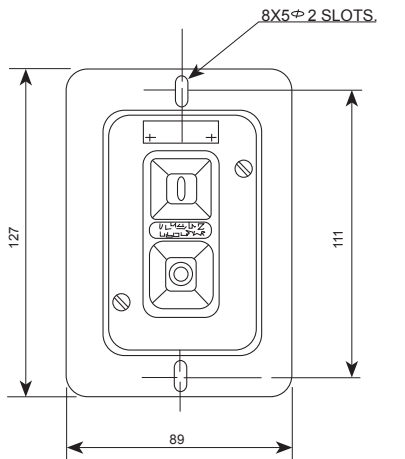


DOL & Star Delta Starter

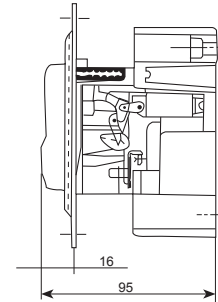
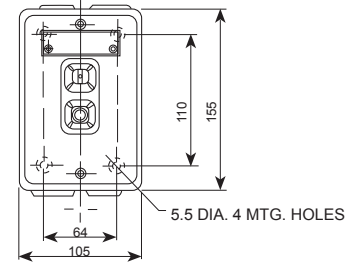
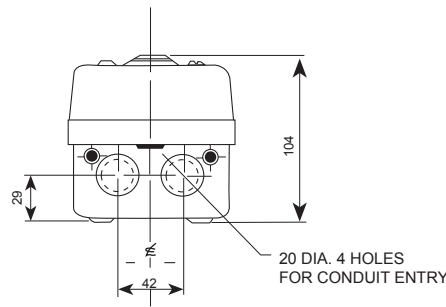


Dimensions (mm)

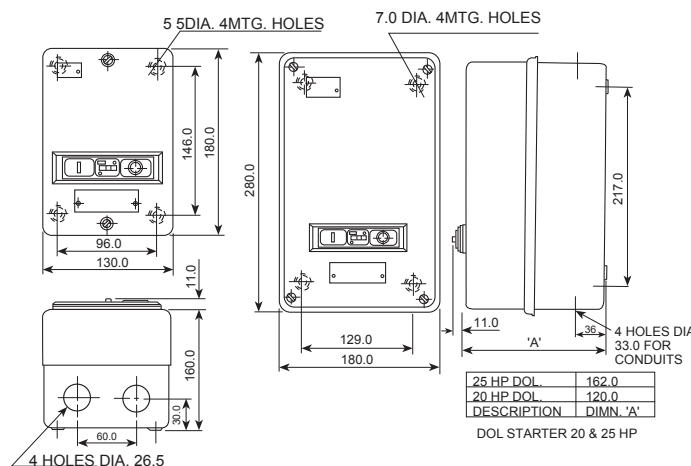
MINI MANUAL STARTER



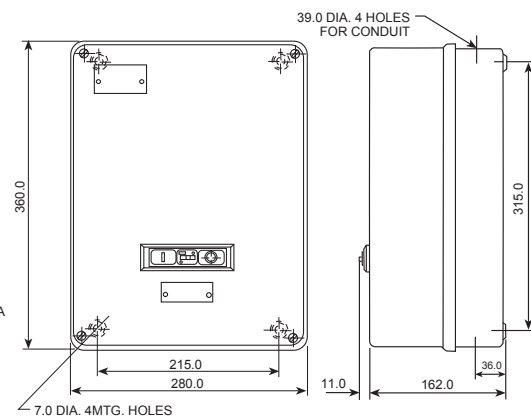
Flush Type



DIRECT-ON-LINE STARTER

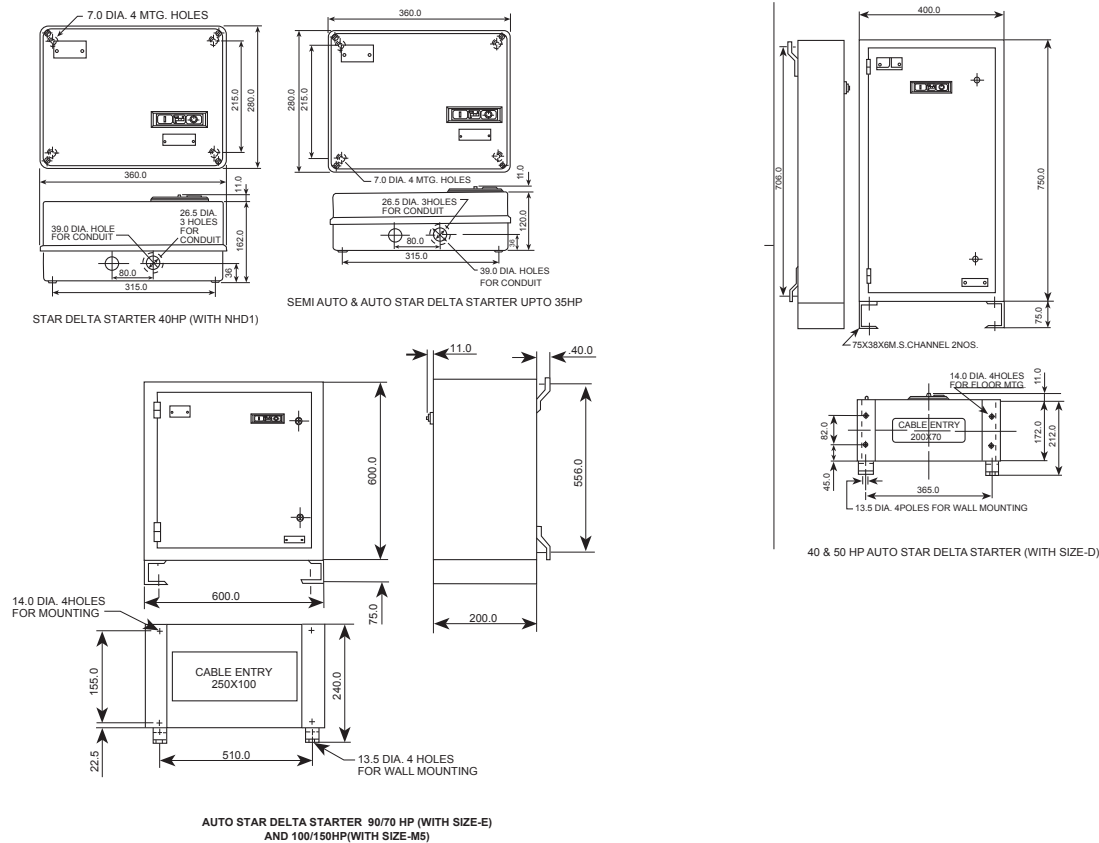


FOR CONDUITS



Dimensions (mm)

STAR DELTA STARTER



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