

Large Motors with DCCA are manufactured using dual circuit cooling technology, offering high power and better reliability. The outputs which are normally available in HT range are now offered in low voltage range with this new technology.

These motors are suitable for use in various industrial sectors such as power generation, petrochemical, cement, steel, paper and pulp, waste water treatment, chemical industries, sugar etc.

The motors can serve various applications such as pump, compressor, conveyor, fan, blower, etc.

Technology

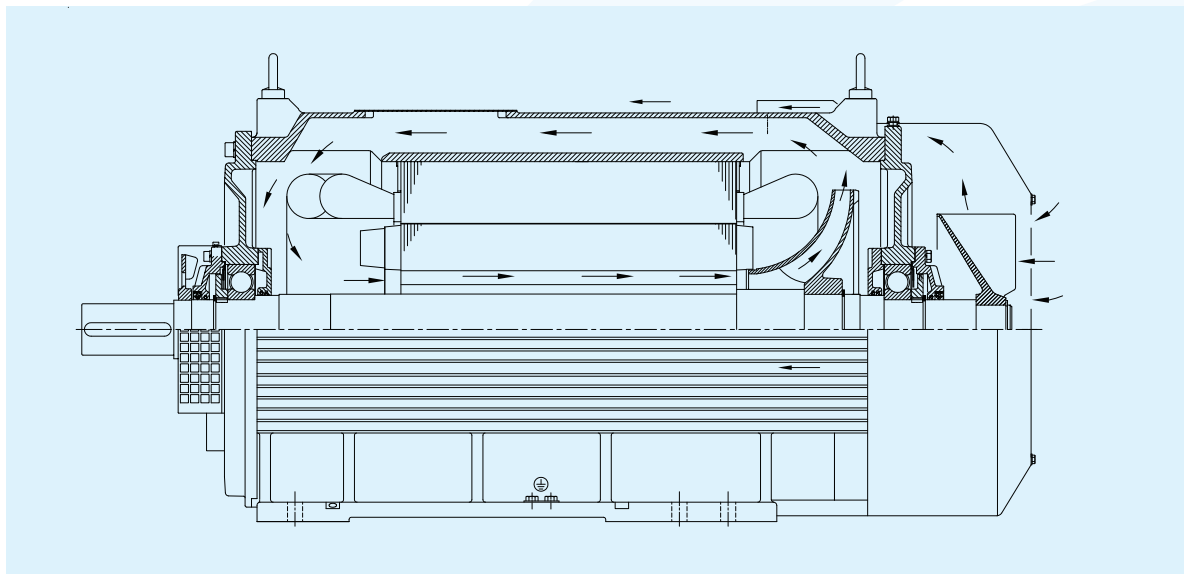
The Dual Circuit Cooling Arrangement (DCCA) is new efficient cooling system used by Bharat Bijlee for High Efficiency Large LT Motors. This technology consists of two independent cooling systems which improves the overall cooling of the motor.

The primary cooling circuit is the regular stator body fin cooling in which the shaft mounted external fan blows air over the stator body fins and cools the motor by forced convection and radiation.

The secondary internal cooling circuit consists of rotor with vent holes, an aluminum impeller and four ventilating ducts on the inside of the stator body. The air inside the motor is circulated by the impeller which passes through the ventilating ducts where it gets cooled on its way from non driving end to the driving end by the primary circuit. This cool air then passes over the DE overhangs and through the rotor vents to the non driving end and on its way absorbing heat from the overhangs and from the rotor. This heated air again passes through the impeller to the ventilating ducts and the cycle repeats.

The advantages of this technology are:

- Lower temperature rise of the winding
- Reduced temperature gradient between DE and NDE sides of the winding on account of uniform distribution of heat
- Enhanced insulation life
- Increased motor reliability
- Reduction in motor size and as a result, higher outputs can be drawn from the same motor.



Dual Circuit Cooling Arrangement

Performance Table for 2-Pole & 4-Pole Motors

TEFC 3 Phase Squirrel Cage Induction Motors - DCCA Series - Frame size 355L/K to 450L

Voltage : 415V± 10% (up to 630kW)
 : 690V± 10% (710kW & above)
 Frequency : 50Hz± 5%
 Combined Variation : ± 10%

Ambient: 40°C

Duty : S1(Continuous)

3000 rpm (2-Pole)

Ins. Class : F
 Temp. Rise : B
 Protection : IP55

Rated Output		Frame size IEC	Type Ref. B3 Construction	Speed RPM	Current Amps.	Rated Torque kg.m	Operating Characteristics at Rated output			With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD ² kgm ²	Net Weight B3 Constn. kg			
kW	HP						FL	3/4L	1/2L	FL	3/4L				1/2L	Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio
355	475	355L/K	2H35K2M3	2982	584	116	0.89	0.87	0.82	95.1	94.0	94.0	6.5	1.7	2.5	23.30	2040
400	536	355L/K	MH35K2P3	2982	654	131	0.89	0.87	0.82	95.6	94.4	94.4	6.5	1.7	2.5	26.00	2160
450	603	355L/K	MH35K2T3	2982	726	147	0.90	0.88	0.84	95.8	94.6	94.6	6.5	1.7	2.5	28.60	2280
500	670	355L/K	MH35K2W3	2982	805	163	0.90	0.88	0.84	96.0	94.8	94.8	6.5	1.7	2.5	31.30	2380
560	750	400L	MH40L293	2985	910	183	0.90	0.88	0.80	95.2	92.4	92.4	7.0	1.7	2.5	51.30	2880
* 630	845	400L	MH40L2A3	2985	1023	206	0.90	0.88	0.80	95.4	92.6	92.6	7.0	1.7	2.5	57.30	3260

1500 rpm (4-Pole)

Rated Output		Frame size IEC	Type Ref. B3 Construction	Speed RPM	Current Amps.	Rated Torque kg.m	Operating Characteristics at Rated output			With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD ² kgm ²	Net Weight B3 Constn. kg			
kW	HP						FL	3/4L	1/2L	FL	3/4L				1/2L	Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio
400	536	355L/K	MH35K4P3	1488	674	262	0.86	0.82	0.73	96.0	94.8	94.8	6.5	2.0	2.5	30.60	2160
450	603	355L/K	MH35K4T3	1488	757	295	0.86	0.82	0.73	96.2	95.0	95.0	6.5	2.0	2.5	33.70	2270
500	670	355L/K	MH35K4W3	1488	830	327	0.87	0.83	0.74	96.3	95.1	95.1	6.5	2.0	2.4	36.80	2380
560	750	400L	MH40L493	1492	918	366	0.88	0.85	0.78	96.4	95.0	95.0	6.8	2.0	2.5	63.00	2810
630	845	400L	MH40L4A3	1492	1032	411	0.88	0.85	0.78	96.5	95.1	95.1	6.8	2.0	2.5	70.50	3000
710	952	450M	MH45M413	1493	702	463	0.88	0.84	0.76	96.2	95.0	95.0	6.8	2.0	2.5	108.0	4100
800	1072	450M	MH45M433	1493	789	522	0.88	0.84	0.76	96.4	95.2	95.2	6.8	2.0	2.5	120.0	4300
900	1206	450M	MH45M453	1493	886	587	0.88	0.84	0.76	96.6	95.4	95.4	6.8	2.0	2.5	132.0	4500
1000	1340	450L	MH45L473	1493	982	652	0.88	0.84	0.76	96.8	95.6	95.6	6.8	2.0	2.5	160.0	5650

Note : 1. Efficiency class 'IE2' will be punched on the nameplates as per IS : 12615-2011 for ratings up to 375kw for 2,4 & 6 Pole ratings.
 2. All performance values are subjected to tolerance as per IS: 325 IS/IEC 60034-1.
 3. Higher ratings can be offered on request in 4, 6 and 8 polarity.
 * Temperature rise limited to class "F"

Performance Table for 6-Pole Motors

TEFC 3 Phase Squirrel Cage Induction Motors - DCCA Series - Frame size 355L/K to 450L

Voltage : 415V± 10% (up to 630kW)
 : 690V± 10% (7.10kW & above)
 Frequency : 50Hz± 5%
 Combined Variation : ± 10%

Ambient : 40°C
 Duty : S1(Continuous)

Ins. Class : F
 Temp. Rise : B
 Protection : IP55

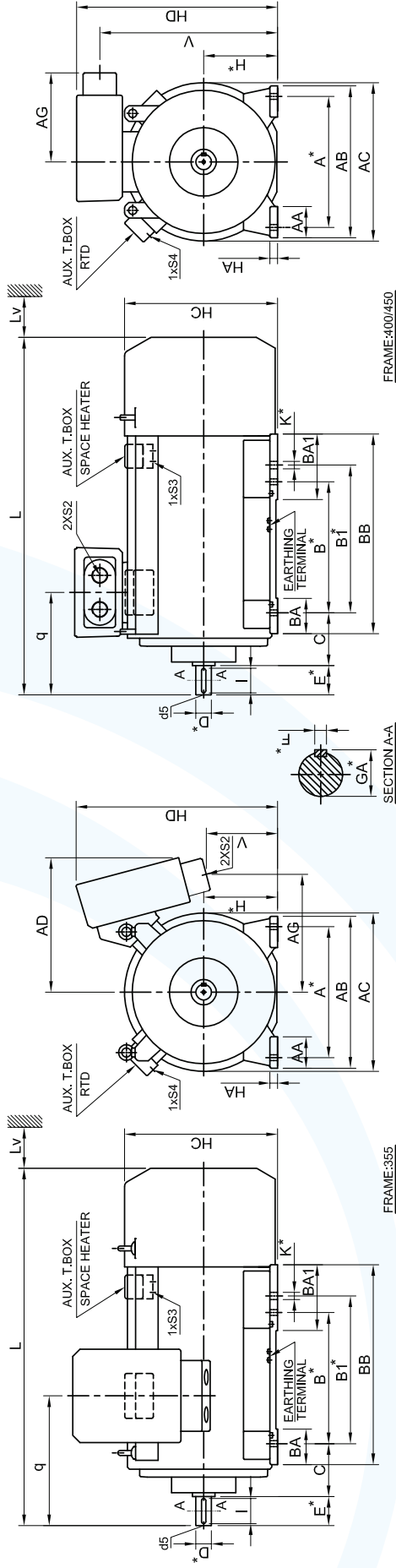
1000 rpm (6-Pole)

Rated Output kW	HP	Frame size IEC	Type Ref. B3 Construction	Operating Characteristics at Rated output										With DOL Starting		Net Weight B3 Consth. kg	
				Speed RPM	Current Amps.	Rated Torque kg.m	Power Factor			% Efficiency			Pullout Torque to Rated Torque Ratio	Rotor GD ² kgm ²			
							FL	3/4L	1/2L	FL	3/4L	1/2L			Starting Current to Rated Current Ratio		Starting Torque to Rated Torque Ratio
315	422	355L/K	2H35K6M3	992	549	309	0.84	0.80	0.70	95.0	95.0	94.2	6.5	1.9	2.5	56.90	1980
355	475	355L/K	2H35K6P3	992	619	349	0.84	0.80	0.70	95.0	95.0	94.2	6.5	1.9	2.5	66.00	2280
400	536	355L/K	MH35K6T3	992	690	393	0.84	0.80	0.70	96.0	96.0	95.4	6.5	1.9	2.5	69.70	2410
450	603	400L	MH40L693	993	775	441	0.84	0.80	0.70	96.2	96.0	95.0	6.5	1.9	2.5	77.00	2810
500	670	400L	MH40L6A3	993	859	490	0.84	0.80	0.70	96.4	96.2	95.2	6.5	1.9	2.5	86.00	3000
560	750	450M	MH45M613	993	961	549	0.84	0.80	0.70	96.5	96.2	95.6	6.5	1.9	2.5	160.0	4100
630	845	450M	MH45M633	993	1080	618	0.84	0.80	0.70	96.6	96.4	95.8	6.5	1.9	2.5	180.0	4300
710	952	450M	MH45M653	993	731	696	0.84	0.80	0.70	96.7	96.6	96.1	6.5	1.9	2.5	200.0	4400
800	1072	450L	MH45L673	993	823	785	0.84	0.80	0.70	96.8	96.7	96.2	6.5	1.9	2.5	236.0	5600

Note : 1. Efficiency class 'IE2' will be punched on the nameplates as per IS : 12615-2011 for ratings up to 375kw for 2,4 & 6 Pole ratings.
 2. All performance values are subjected to tolerance as per IS: 325 IS/IEC 60034-1.

For 8 Pole ratings please refer to sales office.

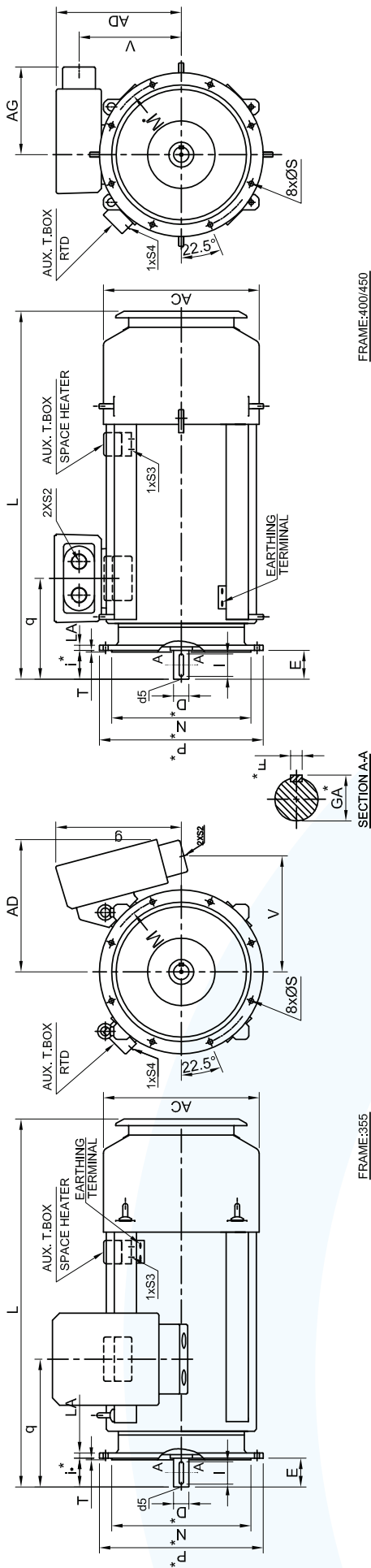
Dimensional Details: Industrial Motors Type-2H, Foot Mounted (B3), TEFC IE2 Series, Frame Size- 355/400/450



IEC Fr. Size	Pole	FIXING										TERMINAL BOX										SHAFT										
		A*	B*	B1*	C	H*	K*	AB	BB	AA	BA	BA1	HA	HC	HD	AD	L	AC	Lv	IEC Fr. Size	V	q	AG	S2 B.S.C.	S3 B.S.C.	S4 B.S.C.	D*	E	F*	GA*	I	d5
355L/K	2	610	630	710	254	355	28	730	960	150	170	315	36	736	985	685	1735	765	200	355L/K	345	625	595	3"	3/4"	1"	75	140	20	79.5	130	M20
355L/K	4/6/8	610	630	710	254	355	28	730	960	150	170	315	36	736	985	685	1765	765	130	355L/K	345	655	595	3"	3/4"	1"	95	170	25	100	160	M24
400M/L	2	686	710	800	280	400	35	820	940	140	170	260	35	824	1076	-	1835	852	250	400M/L	952	560	590	3"	3/4"	1"	80	170	22	85	160	M20
400M/L	4/6/8	686	710	800	280	400	35	820	940	140	170	260	35	824	1076	-	1875	852	200	400M/L	952	600	590	3"	3/4"	1"	110	210	28	116	180	M24
450M	4/6/8	800	1000	-	250	450	42	940	1180	180	260	-	42	935	1210	-	2025	972	200	450M	1086	600	590	3"	3/4"	1"	120	210	32	127	180	M24
450L	4/6/8	800	1250	-	250	450	42	940	1430	180	260	390	42	935	1210	-	2347	972	200	450L	1086	605	590	3"	3/4"	1"	120	210	32	127	180	M24

Dimension	A	B	H	K	D	GA	F	d5 (Centering)	L
Tolerance	+0.75	+0.75	-1	-	m6	-	h9	-	±50
Specification	IS:1231	IS:1231	IS:1231	IS:1231	IS:1231	IS:2048	IS:2048	IS:2540	-

Dimensional Details: Industrial Motor Type-2H, Flange Mounted (V1), TEFC IE2 Series, Frame Size- 355/400/450



FRAME:355

FRAME:400/450

IEC Fr. Size	Pole	FIXING										GENERAL						TERMINAL BOX			
		P	N*	M*	I*	S	T	LA	AD	AC	L	β	V	q	AG	S2 B.S.C.	S3 B.S.C.	S4 B.S.C.			
355L/K	2	800	680	740	140	24	6	25	685	765	1835	630	570	625	-	3"	3/4"	1"			
355L/K	4/6/8	800	680	740	170	24	6	25	685	765	1865	630	570	655	-	3"	3/4"	1"			
400M/L	2	800	680	740	170	24	6	25	-	852	1935	-	552	560	590	3"	3/4"	1"			
400M/L	4/6/8	800	680	740	210	24	6	25	-	852	1975	-	552	600	590	3"	3/4"	1"			
450M	4/6/8	1150	1000	1080	210	28	6	30	-	972	2125	-	636	600	590	3"	3/4"	1"			
450L	4/6/8	1150	1000	1080	210	28	6	30	-	972	2447	-	636	605	590	3"	3/4"	1"			

IEC Fr. Size	Pole	SHAFT							
		D*	E	F*	GA*	I	d5		
355L/K	2	75	140	20	79.5	130	M20		
355L/K	4/6/8	95	170	25	100	160	M24		
400M/L	2	80	170	22	85	160	M20		
400M/L	4/6/8	110	210	28	116	180	M24		
450M	4/6/8	120	210	32	127	180	M24		
450L	4/6/8	120	210	32	127	180	M24		

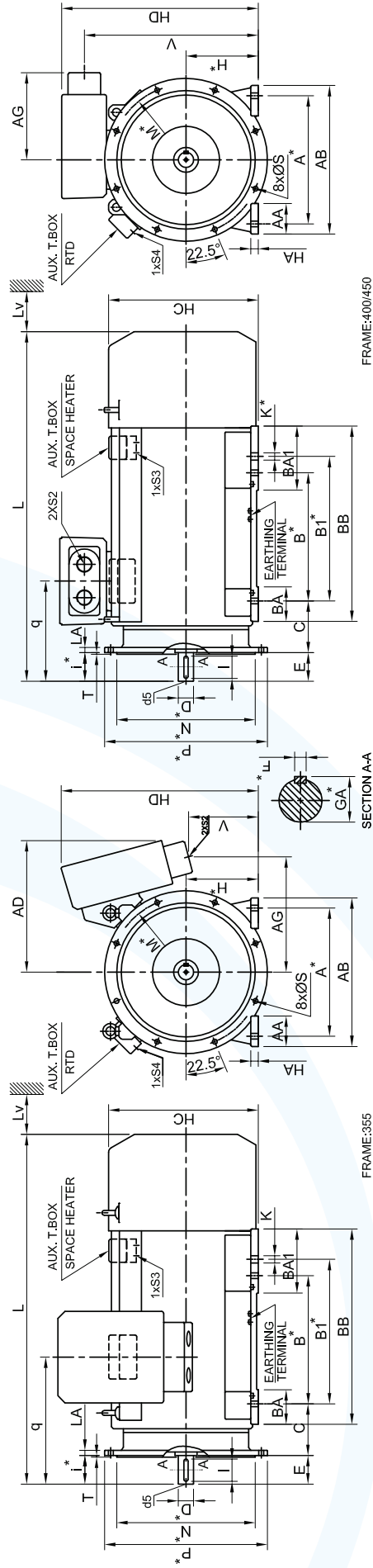
TABLE A

Dimension	N	M	i	D	GA	F	d5 (Centering)	L
Tolerance	js6	±0.5	±1.5	m6	-	h9	-	±50
Specification	IS:2223	IS:2223	-	IS:1231	IS:2048	IS:2048	IS:2540	-



IE2 HIGH EFFICIENCY LARGE MOTORS WITH DCCARS

Dimensional Details: Industrial Motor Type- 2H, Foot and Flange Mounted (B35), TEFC IE2 Series, Frame Size- 355/400/450



FRAME:355

FRAME:400/450

IEC Fr. Size	Pole	FIXING										SHAFT						
		A*	B*	B1*	C	H*	K*	P	N*	M*	I*	S	D*	E	F*	GA*	I	d5
355L/K	2	610	630	710	254	355	28	800	680	740	140	24	75	140	20	79.5	130	M20
355L/K	4/6/8	610	630	710	254	355	28	800	680	740	170	24	95	170	25	100	160	M24
400M/L	2	686	710	800	280	400	35	800	680	740	170	24	80	170	22	85	160	M20
400M/L	4/6/8	686	710	800	280	400	35	800	680	740	210	24	110	210	28	116	180	M24
450M	4/6/8	800	1000	-	250	450	42	1150	1000	1080	210	28	120	210	32	127	180	M24
450L	4/6/8	800	1250	-	250	450	42	1150	1000	1080	210	28	120	210	32	127	180	M24

IEC Fr. Size	Pole	GENERAL										TERMINAL BOX							
		T	LA	AB	BB	AA	BA1	HA	HC	HD	AD	L	AC	Lv	V	S2 B.S.C.	S3 B.S.C.	S4 B.S.C.	
355L/K	2	6	25	730	960	150	170	315	36	736	985	685	1735	765	200	345	3"	3/4"	1"
355L/K	4/6/8	6	25	730	960	150	170	315	36	736	985	685	1765	765	130	345	3"	3/4"	1"
400M/L	2	6	25	820	940	140	170	260	35	824	1076	-	1835	852	250	952	3"	3/4"	1"
400M/L	4/6/8	6	25	820	940	140	170	260	35	824	1076	-	1875	852	200	952	3"	3/4"	1"
450M	4/6/8	6	30	940	1180	180	260	-	42	935	1210	-	2025	972	200	1086	3"	3/4"	1"
450L	4/6/8	6	30	940	1430	180	260	390	42	935	1210	-	2347	972	200	1086	3"	3/4"	1"

TABLE A

Dimension	A	B	H	K	N	M	i	D	GA	F	d5 (Centering)	L
Tolerance	±0.75	±0.75	-1	-	±0.6	±0.5	±1.5	m6	-	h9	-	±50
Specification	IS:1231	IS:1231	IS:1231	IS:1231	IS:2223	IS:2223	-	IS:1231	IS:2048	IS:2048	IS:2540	-