NITECH®

BS: 7626/1993
IEC: 44-1/1996
SISIR.

CURRENT TRANSFORMERS

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Certificate No. 12008

ASTA CERTIFICATION SERVICES

(Incorporated in the year 1938) 23/24 Market Place, Rugby, CV21 3DU, England

Laboratory Ref. No. 68212AC

CERTIFICATE OF SHORT-CIRCUIT RATING

APPARATUS: Twelve ring type current transformers.

DESIGNATION: NITECH

MANUFACTURER: Dixson Industrial (S) Pte Ltd, No. 32 Ang Mo Kio Industrial Park 2, #03-12, Sing Industrial Complex, Singapore 2056

TESTED BY: Testing & Certification Australia
18 Mars Road, Lane Cove, NSW 2066, Australia

DATE(S) OF TESTS: 18 August 1992 to 14 January 1993

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this Certificate has been subjected to the series of proving tests in accordance with

British Standard 3938:1973(1982), Clause 2.5.2

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as stated below.

Rated Short-time Thermal Current : 50 kA rms for 1.0 s
Rated Dynamic Current : 125 kA peak

Measurement CTs
300/5 Class 1, 5 VA; 800/5, 1600/5, 2500/5 Class 1, 15 VA

Protective CTs
300/5 Class 5P5, 5 VA; 400/5, 1000/5 Class 5P10, 20 VA
500/5 Class 5P5, 30 VA; 600/5 Class 10P10, 10 VA;
800/5, 1600/5, 2500/5 Class 10P10, 15 VA

This Certificate also verifies the rated continuous thermal currents of the current transformers, as detailed on Page 2, in accordance with Clause 2.5.3.

The record of Proving Tests apply only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate comprises 17 pages, 1 diagrams, 4 oscillograms, 14 photographs, 5 drawings and 2 other sheets as detailed on page 1

K D Clare ASTA Observer

M. J. Swan Director

16th APRIL 1993 Date

Certificate No 14571

ASTA CERTIFICATION SERVICES

(Incorporated in the year 1938) ASTA House, Chestnut Field, Rugby, CV21 2TL England

Laboratory Ref. No. 101243AC

CERTIFICATE OF SHORT-CIRCUIT RATING

APPARATUS: Two ring type current transformers

DESIGNATION: NITECH

MANUFACTURER: DIXSON INDUSTRIAL (S) PTE LTD
No 32 Ang Mo Kio Industrial Park 2,
Sing Industrial Complex, #03-12 Singapore 569510

TESTED BY: Testing & Certification Australia
18 Mars Road Lane Cove NSW 2066 Australia

DATE(S) OF TESTS: 21 and 22 November 2000

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this certificate has been subjected to the series of proving tests in accordance with

IEC Publication 60044-1:1996 with Amendment No. 1and BSEN 60044-1:1999 Clause 7.1

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as stated below.

Rated short-time thermal current and rated dynamic current

Measurement Current Transformer

800/5 Class 1 : 65 kA for 3 s, 163 kA peak

Protection Current Transformers

1600/5 Class 5P20 : 65 kA for 3 s, 163 kA peak

The record of Proving Tests applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate comprises 8 pages, 2 diagrams, 1 oscillogram, 6 photographs, 3 drawings and no other sheets, as detailed on page .

P J Ryan
ASTA Observer

C. Nicholls
ENGINEERING MANAGER
13th February 2001 Date

NATIONAL ACCREDITATION OF CERTIFICATION BODIES
Registration Number 010

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate number 010

NITECH®

CURRENT TRANSFORMERS(WITH ASTA TEST)

INTRODUCTION

NITECH provides a comprehensive range of current transformers for measuring and protective applications.
—PERFORMANCE TO BS 7626/93—IEC 44-1.
—STANDARD OR CUSTOMISED DESIGNS AVAILABLE

CONSTRUCTION

The high grade silicon steel core is annealled, then insulated with H.D. Polyethylene caps. The secondary winding is toroidally wound by high precision machinery. MR and PR SERIES CTS, the PEW coated windings are then covered with elephantite paper and double-lapped with non adhesive insulating tape,as for the FR SERIES,the construction is the same with the MR & PR series except that it is double-lapped with Fibre-Tape and than varnised. For encapsulated type, Model MSQ,NSQ, RQ&CRQ CTS, has been developed to meet the requirements of modern electrical installation, These range of current transformers is very compact and robust and can be used for a wide range of current measuring purposes. It is designed for the use with busbar of cable conductors. Moreover, Epoxy type current transformer are also available now.

PERFORMANCE

Designated to meet the highest standards in accordance to BS 7276 and IEC44-1 NITECH CTs have performance as follows:

Overloads :As Bs 7276 and IEC 44-1
Temperature :Ambient Range -40°C ti +70°C
Dielectric Strength :2,500V r.m.s. For 1 min
Frequency :50/60Hz
Voltage :Primary rated at 660V AC

MEASURING CURRENT TRANSFORMERS

For measuring current transformers, the secondary current must be directly proportional to the primary current in the working range of 10% to 120%.Normal secondary current are 1A and 5A.
MODEL AVAILABLE:MR,MSQ,EMR,EPR,PR,HG,RCT,JYS AND PNSQ SERIES

TABLE 1-LIMITS OF CURRENT ERROR AND PHASE DISPLACEMENT FOR MEASURING CURRENT TRANSFORMERS (CLASSES FROM 0.1 TO 1)

Accuracy class	± Percentage current(ratio) error at percentage of rated current shown below				± Phase displacement at percentage of rated current shown below							
					Minutes				Centiradians			
	5	20	100	120	5	20	100	120	5	20	100	120
0.1	0.4	0.2	0.1	0.1	15	8	5	5	0.45	0.24	0.15	0.15
0.2	0.75	0.35	0.2	0.2	30	15	10	10	0.9	0.45	0.3	0.3
0.5	1.5	0.75	0.5	0.5	90	45	30	30	2.7	1.35	0.9	0.9
1.0	3.0	1.5	1.0	1.0	180	90	60	60	5.4	2.7	1.8	1.8
	50%		120%		PHASE ERROR NOT APPLICABLE FOR CLASS 3 & 5							
3	±3%		±3%									
5	±5%		±5%									

TABLE2-APPLICATION GUIDE TO ACCURACY CLASS

Accuracy class	Application
0.1	Precision Testing or as a std. For testing other Cts
0.2	Precision Metering
0.5	General Tariff Metering
1.0	Non Revenue measurement incl. Power and energy.
3.0	General industrial measurements.
5.0	Approximate measurements.

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PROTECTION CURRENT TRANSFORMERS

NITECH Protection Current Transformers have been designed to comply with class 5P and 10P with Accuracy Limit Factors (ALF) 5 to 20 times. The optimum selection of Protection Current Transformers in relation to class and ALF require a close examination of the relay characteristic and circuit conditions including the relay burden pilot wire lead burden.
MODEL:AVAILABLE PR,CRQ,FR,EPR AND ENSQ-P SERIES

1.LIMITS OF ERROR (Extract from BS 7626/93 & IEC 44-1)

ACCURACY	CURRENT ERROR AT RATED PRIMARY CURRENT	PHASE ERROR AT RATED PRIMARY CURRENT	COMPOSITE ERROR AT RATED ALF	SPT. ACCURACY LIMIT FACTOR
5P	±1%	±60min	±5%	5,10,15
10P	±3%	—	±10%	OR20

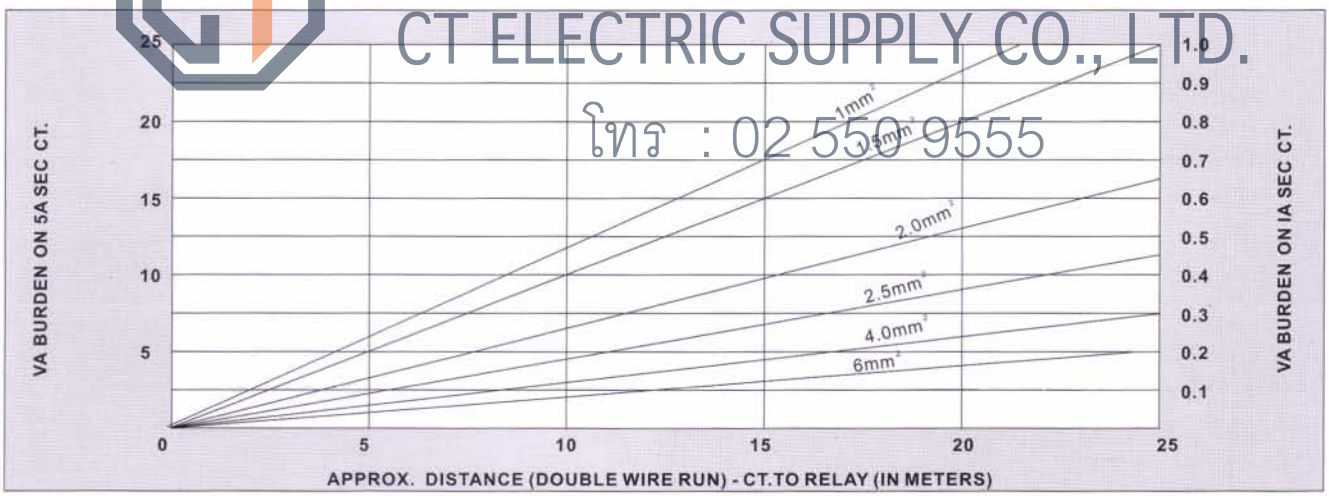
BURDEN REQUIREMENTS

The Burden imposed on a Current Transformer consist mainly of the following:—

i) The impedance of pilot wire between CT & Relay/instruments.
ii) The impedance of the relays or instructments.
iii) The sum of (i) & (ii) constitute the external burden required.

GUIDE TABLE FOR PILOT LEAD BURDEN

The following chart shows the approximate burden imposed on the C.T. for various size of wires at varying distances.



ORDERING INFORMATION

1. When ordering please specity:-
   a) Ratio: 30/5A to 10000/5A 20/1A to 5000/1A
   b) Class: 3,1,0.5,5P,10P,X.
   c) Burden: 2.5,5,10,15,20.etc.
   d) For protection: P5,P10,P15 etc. (ALF)
   e) Type: MR,PR,MSQ, etc.

2. For special sizes, VA, Class & Burden provide additional informations like:-
   a) Internal Diameter required in mm.
   b) External Diameter if there are limitations.
   c) Secondary Current if other than 5A

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SELECTION GUIDE:

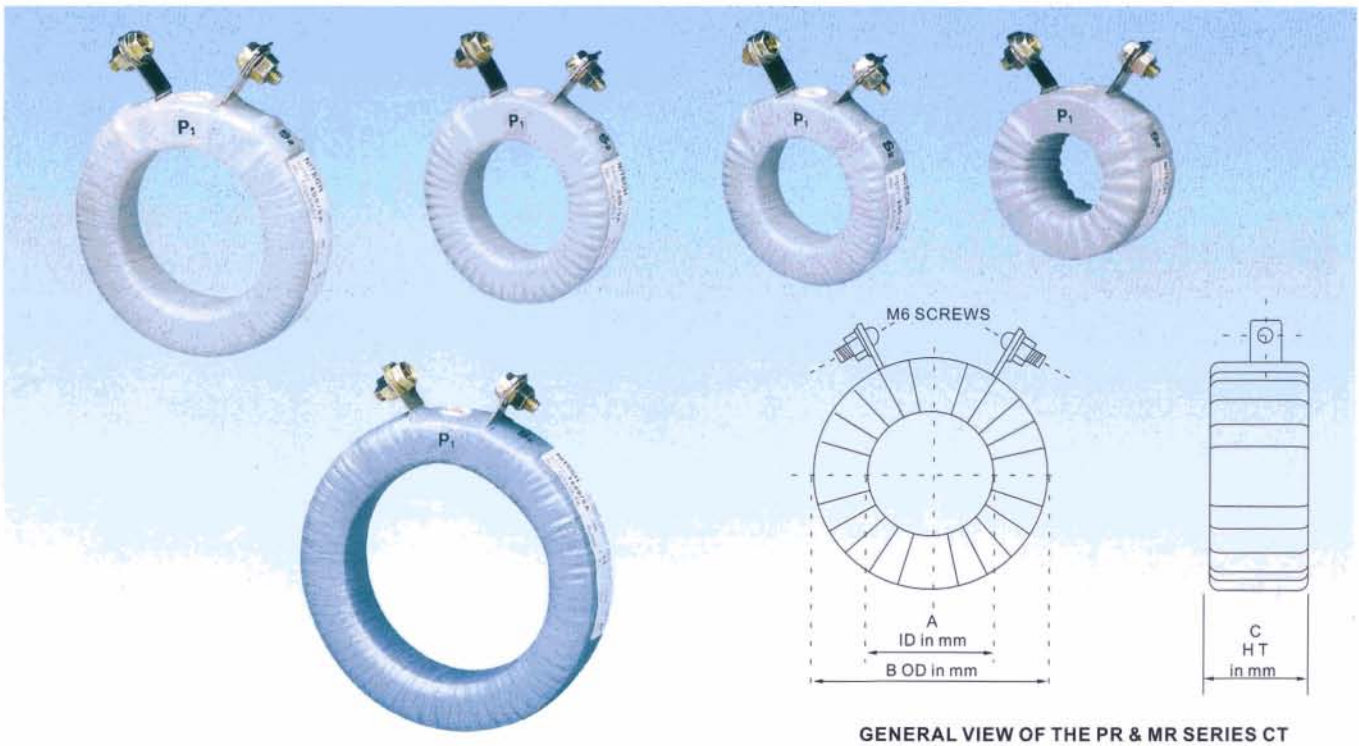
The design of protective systems,of which the current transformers are a vital part, can be a complex one, and we offer here a guide only to those simpler schemes which occur frequently. Our suggested ratings for these applications should be treated with caution as they may be subject to variation due to relay characteristics or to other components of the scheme.

RELAY MANUFACTURER,S RECOMMENDATION SHOULD ALWAYS BE FOLLOWED

General Type of Relay	Protective System	Typical C.T.Requirement		
		VA(Add Lead Burden if >1.5VA)	Class	Accuracy Limit Factor
Magnetic Trips	overcurrent	2.5-5	10P	5
Magnetic O/L with dashpot	Motor Overcurrent with time delay	5	10P	5-10
Some low consumption.thermal types	Motor Overcurrent with time delay	2.5	10P	10 to 15
Thermal	Motor Overcurrent with time delay	7.5	10P	10 to 15
Inverse Definite Min.Tine relays(I.D.M.T)	Overcurrent	15	10P	10 to 15
I.D.M.T.Earth Fault Relays	Unrestricted earth fault with approx. time grading.	15	10P	10
I.D.M.T.Earth Fault Relays	Unrestricted earth fault where phase fault stability or accurate time grading required	15	5P	10

STANDARD PRODUCT:(TAPE RING TYPE)

The following are our PVC Taped Ring Insulation class CT. For any orders different from the following are classified as special,PLEASE consult our distributor/sales engineer.



GENERAL VIEW OF THE PR & MR SERIES CT

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MR MEASURING CURRENT TRANSFORMER

Model	Ratio	Burden	Class	ID(A)	OD(B) All in mm	HT(C)
MR	30/5A	1.5VA	5	35	67	40
MR	60/5A	2.5VA	3	32	67	30
MR	100/5A	5VA	3	42	78	30
MR	150/5A	5VA	1	42	78	20
MR	200/5A	5VA	1	42	78	20
MR	250/5A	5VA	1	42	78	20
MR	300/5A	5VA	1	45	78	20
MR	400/5A	10VA	1	60	104	20
MR	500/5A	15VA	1	60	104	20
MR	600/5A	15VA	1	60	104	20
MR	800/5A	15VA	1	75	108	20
MR	1000/5A	30VA	1	85	124	20
MR	1200/5A	30VA	1	85	124	20
MR	1600/5A	30VA	1	85	125	20
MR	2000/5A	30VA	1	116	130	20
MR	2250/5A	30VA	1	116	130	20
MR	2500/5A	45VA	1	120	160	20
MR	3000/5A	45VA	1	120	162	20

PR PROTECTION CURRENT TRANSFORMER 10P10

Model	Ratio	Burden	Class	ID(A)	OD(B) All in mm	HT(C)
PR	100/5A	5VA	10P10	42	106	70
PR	150/5A	7.5VA	10P10	42	106	70
PR	200/5A	7.5VA	10P10	42	106	55
PR	250/5A	7.5VA	10P10	42	110	55
PR	300/5A	7.5VA	10P10	45	110	55
PR	400/5A	10VA	10P10	60	110	55
PR	500/5A	10VA	10P10	60	110	55
PR	600/5A	10VA	10P10	60	110	45
PR	800/5A	15VA	10P10	75	124	45
PR	1000/5A	15VA	10P10	85	135.5	35
PR	1200/5A	15VA	10P10	85	135.5	32
PR	1600/5A	15VA	10P10	95	153	32
PR	2000/5A	15VA	10P10	95	161	32
PR	2250/5A	15VA	10P10	115	161	32
PR	2500/5A	15VA	10P10	115	161	32
PR	3000/5A	15VA	10P10	114	161	32

PR PROTECTION CURRENT TRANSFORMER 10P20

Model	Ratio	Burden	Class	ID(A)	OD(B) All in mm	HT(C)
PR	100/5A	5VA	10P20	42	106	125
PR	150/5A	5VA	10P20	42	106	115
PR	200/5A	5VA	10P20	42	106	85
PR	250/5A	7.5VA	10P20	42	98	85
PR	300/5A	7.5VA	10P20	45	110	85
PR	400/5A	7.5VA	10P20	60	110	95
PR	500/5A	10VA	10P20	60	110	100
PR	600/5A	10VA	10P20	60	110	85
PR	800/5A	15VA	10P20	75	124	75
PR	1000/5A	15VA	10P20	85	135.5	55
PR	1200/5A	15VA	10P20	85	135.5	55
PR	1600/5A	15VA	10P20	95	153	55
PR	2000/5A	15VA	10P20	115	153	55
PR	2250/5A	15VA	10P20	115	161	55
PR	2500/5A	15VA	10P20	115	161	55
PR	3000/5A	15VA	10P20	115	161	45

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EPOXY MEASURING CURRENT TRANSFORMER

Model	Ratio	Burden	Class	ID(A)	OD(B)All in mm	HT(C)
EMR	30/5A	2.5VA	5	20	80	40
EMR	60/5A	2.5VA	1	20	80	40
EMR	100/5A	2.5VA	1	34	80	40
EMR	120/5A	2.5VA	1	34	80	40
EMR	150/5A	2.5VA	1	34	80	40
EMR	200/5A	5VA	1	42	90	30
EMR	250/5A	5VA	1	42	90	30
EMR	300/5A	7.5VA	1	42	90	30
EMR	400/5A	7.5VA	1	65	110	30
EMR	500/5A	10VA	1	65	110	30
EMR	600/5A	15VA	1	65	110	30
EMR	800/5A	15VA	1	75	120	30
EMR	1000/5A	15VA	1	85	150	40
EMR	1200/5A	15VA	1	85	150	40
EMR	1600/5A	20VA	0.5	110	175	40
EMR	2000/5A	20VA	0.5	110	175	40
EMR	2250/5A	20VA	0.5	110	175	40
EMR	2500/5A	30VA	0.5	130	190	40
EMR	3000/5A	30VA	0.5	130	190	40

EPOXY PROTECTION CURRENT TRANSFORMER 10P10

Model	Ratio	Burden	Class	ID(A)	OD(B)All in mm	HT(C)
EPR	100/5A	5VA	5P10	34	150	95
EPR	150/5A	5VA	5P10	34	150	75
EPR	200/5A	5VA	5P10	45	135	50
EPR	250/5A	5VA	5P10	45	135	50
EPR	300/5A	7.5VA	5P10	45	135	50
EPR	400/5A	7.5VA	5P10	65	140	50
EPR	500/5A	10VA	5P10	65	140	50
EPR	600/5A	15VA	5P10	65	140	50
EPR	800/5A	15VA	5P10	75	145	50
EPR	1000/5A	15VA	5P10	85	160	70
EPR	1200/5A	15VA	5P10	85	160	70
EPR	1600/5A	15VA	5P10	110	180	50
EPR	2000/5A	15VA	5P10	110	180	50
EPR	2250/5A	15VA	5P10	110	180	50
EPR	2500/5A	15VA	5P10	130	200	50
EPR	3000/5A	15VA	5P10	130	200	50

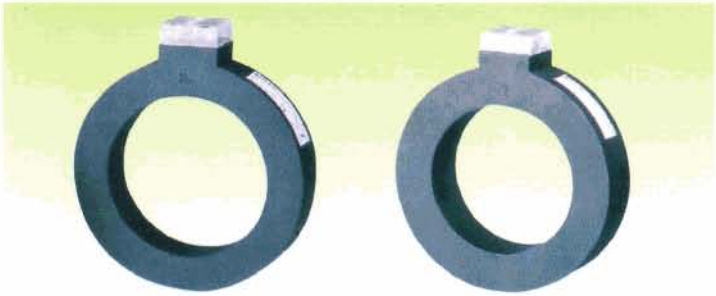
EPOXY PROTECTION CURRENT TRANSFORMER 10P20

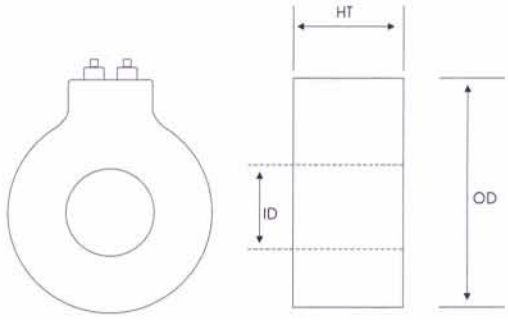
Model	Ratio	Burden	Class	ID(A)	OD(B)All in mm	HT(C)
EPR	100/5A	5VA	5P20	34	150	120
EPR	150/5A	5VA	5P20	34	150	95
EPR	200/5A	5VA	5P20	45	160	75
EPR	250/5A	7.5VA	5P20	45	160	75
EPR	300/5A	10VA	5P20	45	160	75
EPR	400/5A	15VA	5P20	65	175	75
EPR	500/5A	15VA	5P20	65	175	75
EPR	600/5A	15VA	5P20	65	175	75
EPR	800/5A	15VA	5P20	75	180	75
EPR	1000/5A	15VA	5P20	85	190	80
EPR	1200/5A	15VA	5P20	85	190	80
EPR	1600/5A	15VA	5P20	110	200	60
EPR	2000/5A	15VA	5P20	110	200	60
EPR	2250/5A	15VA	5P20	110	200	60
EPR	2500/5A	15VA	5P20	130	210	60
EPR	3000/5A	15VA	5P20	130	210	60

NITECH®

STANDARD PRODUCT:(EPOXY RESIN CAST TYPE)

The following are our epoxy Resin Cast Ring CT.For any orders different from the following are classified as special, PLEASE consult our distributor / sales engineer.

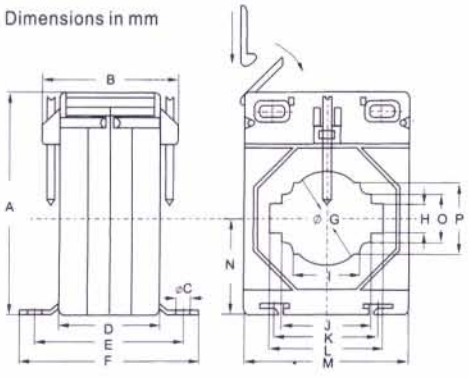




CAST RESIN ENCAPSULATED TYPE

Outine drawing of HG 62/WS to HG 140/100

Dimensions in mm



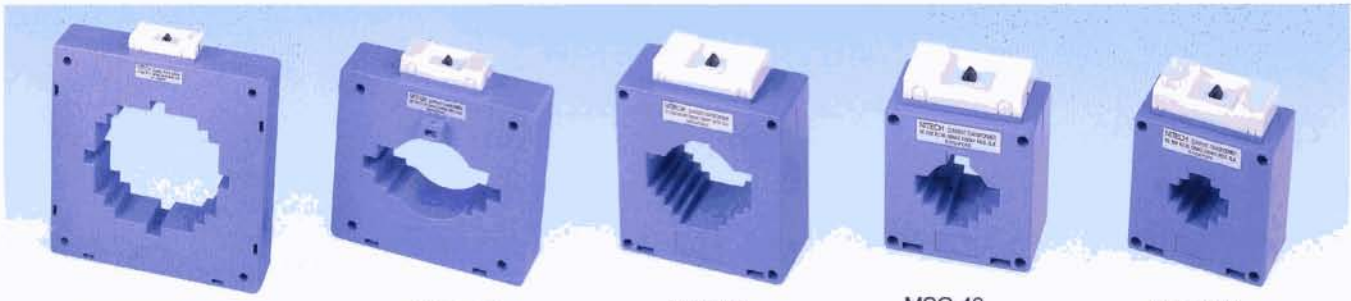
Dimension of Case Unit:M/M

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
HG62/WS	77	/	6.5	36	57.5	72	8	/	/	/	48	/	61	33	/	/
HG62/20	77	/	6.5	36	57.5	72	21	/	/	/	48	/	61	33	/	/
HG62/30	77	47	6.5	36	57.5	72	/	12	21	26	48	31	61	32.5	21	26
HG62/40	77	47	6.5	36	57.5	72	31	11	16	31	48	40	61	33	21	31
HG74/50	98	52	6.5	36	57.5	72	41	13	31	41	48	51	74	41	21	31
HG86/60	110	52	6.5	36	57.5	72	50	12	21	50	48	60	86	49	31	50
HG104/80	126	52	6.5	36	57.5	72	65	12	31	61	48	81	104	57	31	50.5
HG140/100	155	52	6.5	36	57.5	72	86	31	51	61	/	101	140	74	51	81

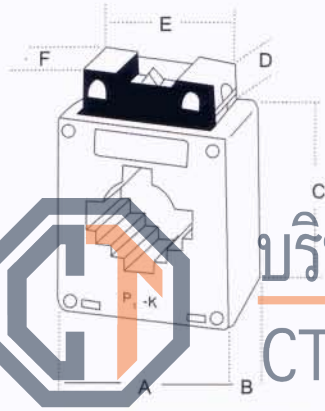
Model	Rated Current(A) Primary/Secondary	Rated Burden(VA)	Accuracy Class	Rated Voltage	Rated Frequency
HG62/WS	30/5A-100/5A	1.5-2.5	3.0-1.0	720V	50/60Hz
HG62/20	50/5A-300/5A	1.5-5	1.0-0.5	720V	50/60Hz
HG62/30	150/5A-800/5A	2.5-10	1.0-0.5	720V	50/60Hz
HG62/40	150/5A-800/5A	2.5-10	1.0-0.5	720V	50/60Hz
HG74/50	250/5A-1000/5A	5-10	1.0-0.5	720V	50/60Hz
HG86/60	250/5A-1500/5A	5-15	1.0-0.5	720V	50/60Hz
HG104/80	300/5A-2000/5A	5-15	1.0-0.5	720V	50/60Hz
HG140/100	1000/5A-3000/5A	5-15	1.0-0.5	720V	50/60Hz

NITECH®

CAST RESIN ENCAPSULATED TYPE



MSQ-130 MSQ-100 MSQ-60 MSQ-40 MSQ-30



Outine drawing of MSQ
Dimension in mm

Model	Ratel Current(A) Primary/Secondary	Busbar Hole Dimension	Rated Burden (VA)	Accuracy Class	Rated Voltage	Rated Frequency
MSQ-30	50/5A-300/5A	30×10mm	2.5-5	1.0	600V	50/60Hz
MSQ-40	150/5A-500/5A	40×10mm	5	1.0	600V	50/60Hz
MSQ-60	400/5A-1200/5A	60×20mm	10	1.0	600V	50/60Hz
MSQ-100	800/5A-3000/5A	100×10mm	15	1.0	600V	50/60Hz
MSQ-130	2000/5-4000/5A	130×10mm	15	1.0	600V	50/60Hz

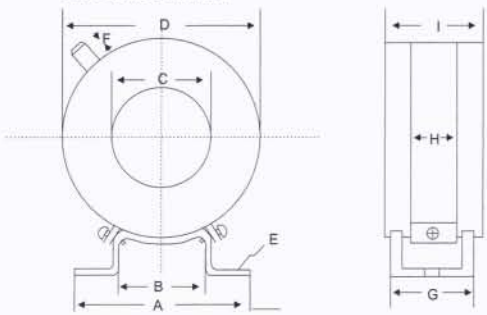
Dimension of Case Unit:M/M

Model	A	B	C	D	E	F
MSQ-30	75	43	82	17	60	31
MSQ-40	75	43	82	17	60	31
MSQ-60	101	45	112	17	60	31
MSQ-100	145	45	139	17	60	31
MSQ-130	184	45	210	17	60	31

RCT-110 RCT-90 RCT-58 RCT-35

Model	Ratel Current(A) Primary/Secondary	Busbar Hole Dimension	Rated Burden (VA)	Accuracy Class	Rated Voltage	Rated Frequency
RCT-35	50/5A-300/5A	—	2.5-5	1.0	600V	50/60Hz
RCT-58	300/5A-1200/5A	—	5.10	1.0	600V	50/60Hz
RCT-90	800/5A-2000/5A	—	15	1.0	600V	50/60Hz
RCT-110	1500/5A-4000/5A	—	15	1.0	600V	50/60Hz

Outine drawing of RCT
Dimension in mm



Dimension of Case Unit:M/M

Model	A	B	C	D	E	F	G	H	I
RCT-35	90	52	35	79	2	15	45	26	54
RCT-58	90	52	58	102	2	15	45	26	56
RCT-90	107	55	90	137	2	15	40	26	50
RCT-110	109	55	110	163	2	15	45	26	50

NITECH®

CURRENT TRANSFORMERS

Certificate No 15843

ASTA CERTIFICATION SERVICES

(Incorporated in the year 1938) ASTA House, Chestnut Field, Rugby, CV21 2TL, England

CERTIFICATE OF TYPE TEST

Laboratory Ref. No. 101945AC

APPARATUS: Two ring-type 0.66/3/- kV (Um/Insulation level), 50 Hz, cast resin current transformers comprising one single-ratio 2500/5 A measuring current transformer and one single-ratio 2250/5 A protective current transformer.

DESIGNATION: NITECH Current Transformers
2500/5A Type EMR-130 and 2250/5A Type EPR-110

MANUFACTURER: Dixson Industrial (s) Pte Ltd
No.32 Ang Mo Kio Industrial Park 2, #03-12,
Sing Industrial Complex,
Singapore 569510

TESTED BY: Testing & Certification Australia
18 Mars Road Lane Cove NSW 2066 Australia

DATE(S) OF TESTS: 13 December 2004 to 5 January 2005

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this certificate has been subjected to the series of proving tests in accordance with

IEC Publication 60044-1 : 2003 Consolidated Edition 1.2 and BSEN 60044-1 : 1999 with Amendments No. 1 and 2, Clauses 7.1, 7.2, 8.3, 8.4, 11.4, 12.4 and 12.5

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as stated below.

Rated short-time thermal and dynamic current (Clause 7.1) : 63 kA for 3 s, 158 kA peak

Rated continuous thermal current (Clause 7.2) : Equal to rated primary current

Power-frequency withstand and Inter-turn overvoltage tests
(Clauses 8.3 and 8.4) : Complied

Accuracy of measuring current transformers (Clause 11.4)
2500/5 : Class 1 M

Current error, phase displacement and composite error of protective current transformers (Clauses 12.4 and 12.5)
2250/5 : Class 5P20

The record of Proving Tests applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

This Certificate comprises 11 pages, 1 diagram, 1 oscillogram, 6 photographs, 4 drawings and no other sheets, as detailed on page 1.

UKAS PRODUCT CERTIFICATION
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M. A. Carstedt
ASTA Observer

C. Nicholls
DIRECTOR

8th February 2005 Date