



TRANSFORMERS



CIRCLE-C
TRANSFORMERS

Circle-C Solutions



PROVIDING QUALITY SOLUTIONS SINCE 1950

- Mining
- Utilities
- Rail
- Defence
- Switchboard Builders
- Manufacturing
- OEM
- Engineering
- Industrial and General Purpose Use

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September 2019



The Company



THE COMPANY

Circle-C Energy Controls Pty. Ltd. specialise in a large range of:

- Transformers
- Reactors / Inductors
- Voltage transformers (oil and dry types)
- Oil filled metering units
- Current transformers (oil & dry types)
- DC Power Suppliers
- Constant Voltage Transformers
- Testing equipment

We also manufacture electrical equipment for low and high voltage applications to your requirements.

Circle – C Transformer designs exceed Australian Mining standards and are used extensively by the mining industry.

We source only the best raw materials internationally; our modern manufacturing facility and quality standards, coupled with outstanding engineering design, produce the highest quality transformers.

Our products are designed to operate in the harshest environments. High grade electrical steel is used ensuring low iron losses and all windings are manufactured from high conductivity PEI2 insulated circular or rectangular copper conductors. Transformers are manufactured using materials for Class A (105°C), Class B (130°C), Class F (155°C) or Class H (180°C) applications.

All designs ensure low losses and high efficiency.

Circle – C Energy Controls is an ISO/9001; ISO 14001 Environmental;
AS/NZS 4801 OHS certified Company



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Low / Medium Voltage

LOW VOLTAGE

SINGLE PHASE -1200V

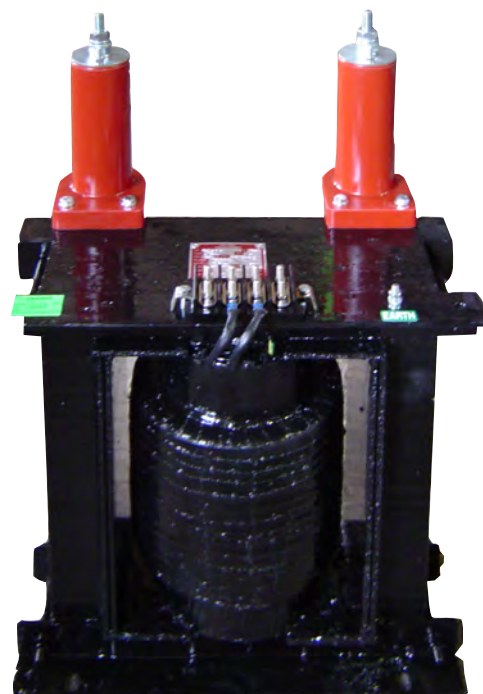
- Current ratings up to 10,000Amp or 120kVA
- Primary & Secondary Fuses supplied if required
- Insulation Levels available include 3kV, 5kV, 10kV, 15kV and 28kV
- Supplied open type (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- All transformers provided with interwinding earthed screen
- Isolation type or double insulated/isolation type available
- Autotransformer wound also available
- To AS60076



MEDIUM VOLTAGE

SINGLE PHASE TO 3.3KV, 6.6KV, 11KV & 13.8KV

- 3.3kV sizes to 100kVA with Insulation level 3.6/16/40kV
- 6.6kV sizes to 50kVA with Insulation level 7.2/20/60kV
- 11kV sizes to 50kVA with Insulation level 12/28/75kV
- 13.8kV sizes to 50kVA with Insulation level 12/28/75kV
- Primary & Secondary Fuses supplied if required
- Supplied open type (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- All transformers provided with interwinding earthed screens
- to AS60076



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Single Phase / Low Voltage

SINGLE PHASE

CAST RESIN UP TO 1KVA 6.6KV/110V AND 11KV/110V

- Double Pole with interwinding earth screen
- Primary Fuses provided.
- Centre tap secondary winding (mining application)
- Standard IL12/28/75kV for 11kV
- Standard IL7.2/20/60kV for 6.6kV
- Can be used as a class 3 VT at Voltage factor 1.2/cont.
- 95kV BIL Option



LOW VOLTAGE

THREE PHASE up to 1200V

- Current ratings up to 4,000Amp or 600kVA
- Primary & Secondary Fuses supplied if required
- Insulation Levels available include 3kV, 5kV, 10kV, 15kV and 28kV
- Supplied open type (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- All transformers provided with interwinding earthed screens
- Isolation type or isolation and double insulated
- Autotransformer wound also available
- to AS60076



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Medium Voltage / Three Phase

MEDIUM VOLTAGE

THREE PHASE to 3.3kV, 6.6kV and 11kV

- 3.3kV sizes to 250kVA with Insulation level 3.6/16/40kV
- 6.6kV sizes to 250kVA with Insulation level 7.2/20/60kV
- 11kV sizes to 185KVA with Insulation level 12/28/75kV
- Primary & Secondary Fuses supplied if required
- Supplied open type (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- All transformers provided with interwinding earthed screens
- Isolation type or isolation and double insulated
- to AS60076



THREE PHASE TRANSFORMERS

are also designed and manufactured to suit OTHER applications, including:

- Neutral earthing transformers Zn0 vector, for low voltage up to and including 11KV
- Korndorfer Motor Starting Autotransformers, low voltage to 11kV up to 2MVA (depending on FLC & Run Up Time).
- 3 Phase AC Motor Starting Reactor up to 6.6kV 1500kW with taps that provide changes in inductance to suit customer requirements
- K Factor transformers up to K13 (for harmonic applications)
- Rectifier transformers for heavy current, up to 1000V for DC Power Supplies



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Industrial General Purpose Use

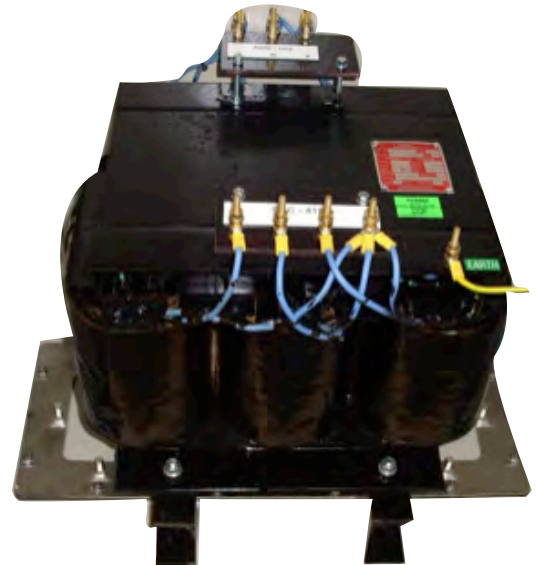
MAGCOM SINGLE PHASE TRANSFORMER



- Low Voltage up to 1000V
- Up to 50Amps or 10KVA
- Supplied open type (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- Suitable for industrial use and/or general purpose use
- Autotransformer wound also available

MAGCOM THREE PHASE TRANSFORMER

- Up to 40Amps or 15KVA
- Supplied open type (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- Suitable for industrial use and/or general purpose use
- Autotransformer wound also available Low Voltage up to 1000V



Accreditations

NATA Test upon request

Recertifications for Metering Units



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Our People



Cutting core strips and yokes



Building 3 Phase Core



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Our People



Testing of Single Phase Power Transformer



HV Winding



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Industrial Transformers



**THREE PHASE ENCLOSED MOTOR
STARTER AUTO TRANSFORMER**

**SINGLE PHASE OPEN TYPE NEUTRAL
EARTHING TRANSFORMER (ZIG-ZAG)
COMPLETE WITH HV BUSHINGS**



**THREE PHASE 11KV POWER TRANSFORMER
COMPLETE WITH HV HRC FUSES**

**THREE PHASE ENCLOSED TYPE NEUTRAL
EARTHING TRANSFORMER (ZIG-ZAG)
COMPLETE WITH HV BUSHING AND CT**



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Constant Voltage Transformers

CONSTANT VOLTAGE TRANSFORMERS

Transformers (Line Conditioners) Ferro-resonant type Designed to provide a constant output voltage when there are substantial fluctuations in supply voltage

- Single phase from 120VA to 7.5kVA up to 1000V
- Three phase up to 75kVA up to 1000V
- Inherent short circuit protection
- Provides sinusoidal output with less than 3% harmonic distortion
- Provided on a gear tray (IP00), caged (IP20) or Enclosed (IP21)
- Provided as a portable type (IP20) with double GPO on output and 1.8m supply lead.
- Supplied as standard for voltage fluctuations $\pm 15\%$, output constant at $\pm 3\%$
- Special calibration to cater for line side voltage fluctuations of 40%.
- Standard with centre tap for mining applications.
- Portable types available supplied enclosed with supply lead and output double GPO
- Optional long life capacitors available for all models



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Voltage Transformers

VOLTAGE TRANSFORMERS

DRY TYPE SINGLE & THREE PHASE - LOW VOLTAGE UP TO 11KV

- Single phase available class 0.2, class 0.5, class 1, class 2 & class 3
- Single phase with protection class 2P or 3P
- Single phase provided with or without Primary Fuses
- Single phase to AS/NZS60044.2
- Three phase available class 0.2, class 0.5, class 1, class 2 & class 3
- Three phase with protection class 2P or 3P
- Three phase provided with or without Primary Fuses.
- Three phase to AS1243
- Vectors Yyn0, YNyn0, Yy open delta available
- Category A, Category B
- BIL up to 12/28/75kV for 11kV



OIL FILLED TYPE SINGLE & THREE PHASE

SINGLE & THREE PHASE MV VOLTAGE TRANSFORMERS 11KV, 22KV & 33KV

- Single phase available class 0.2, class 0.5, class 1, class 2 & class 3
- Single phase with protection class 2P or 3P
- Single phase provided with or without Primary Fuses
- Single phase to AS/NZS60044.2
- Three phase available class 0.2, class 0.5, class 1, class 2 & class 3
- Three phase with protection class 2P or 3P
- Three phase provided with or without Primary Fuses.
- Three phase to AS1243
- 11kV BIL 12/28/95kV, 22kV BIL 24/50/150kV, 33kV BIL 36/70/200kV (higher BIL available)
- Vectors Yyn0, YNyn0, Yy open delta available
- Category A, Category B
- Oil filled in pole/platform mounting tanks for outdoor use
- Voltage factors as specified in the relevant standard.
- Refurbishment and Recertification



Oil Filled Metering Units / AC Reactors

OIL FILLED OUTDOOR POLE/PLATFORM METERING UNITS

11kV/22kV/33kV & combined 11kV/22kV

- Available 5 or 6 Bushing (2 or 3 Current transformers)
- Category A or category B or category A/B
- 3 Phase or 3 single phase Voltage transformers up to Vf1.9/30secs up to 200VA/phase to AS1243 or AS/NZS60044.2 (generally class 0.5M) Current transformer ratios up to 1200/5 classes from 0.2 to AS/NZS 60044.1
- Multi ratios Current Transformers are also available
- Can be provided with additional protection current transformers
- Surge Protection brackets provided
- Primary and secondary fuses provided to suit utility specification
- Oil site glass provided and High grade oil utilised
- Hot dipped galvanised 5mm steel tanks used with draining facility
- Rating plates & brass wiring diagram plate provided as standard
- Designed to suit All Utility requirements
- Routine test reports provided as standard
 - NATA test reports are optional
- Refurbishment and Recertification
- Dry type metering unit



AC REACTORS



- Single and 3 phase low voltage up to 3.3kV
- Single phase for system voltages of 6.6kV and 11kV
- Air or iron core types to customers specifications
- Current limiting type to customers specification
- Harmonic filter type to customers specification
- Neutral earthing reactor to customers specification
- In rush current reactor to customers specification
- Designed, manufactured and routine tested to AS1028



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Current Transformers / DC Power Supplies

CURRENT TRANSFORMERS

LOW VOLTAGE TO 11KV – DRY TYPE

- Available in cast resin, melinex, PVC or cotton tape also varnished.
- Metering or Protection class as required to AS/NZS and IEC standards
- Available as through type, wound primary type, interposing type, summation type and special post type. Wound Primary type up to 11kV (imported indoor & outdoor up to 33kV)
- Interposing type ratios from 1/1
- Through type ID: 50mm to 250mm, ratios 50/1 or 5 up to 8,000/1 or 5 Manufactured for indoor or outdoor use (specify use)
- Current Transformers up to 33kv - oil type
- Outdoor due in tank with multiple core (specify)



DC POWER SUPPLIES

REGULATED OR FILTERED AND REGULATED

- Range from 90W to 100kW
- DC Voltage output range 4V to 240V
- AC input voltage up to 1000V
- Open or enclosed type standard and non standard designs available
- Designed utilising full wave bridge rectifiers Variable DC outputs to customers designs
- Regulated and regulated/filtered type $\pm 3\%$ output tolerance, utilising the constant voltage transformer.
- Filtered type for a smooth DC output (distortion free)
- Special sizes and types manufactured to customers requirements



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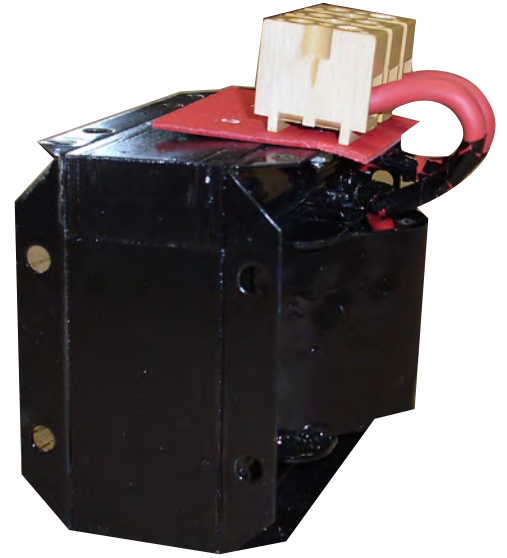
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DC Chokes / Test Equipment

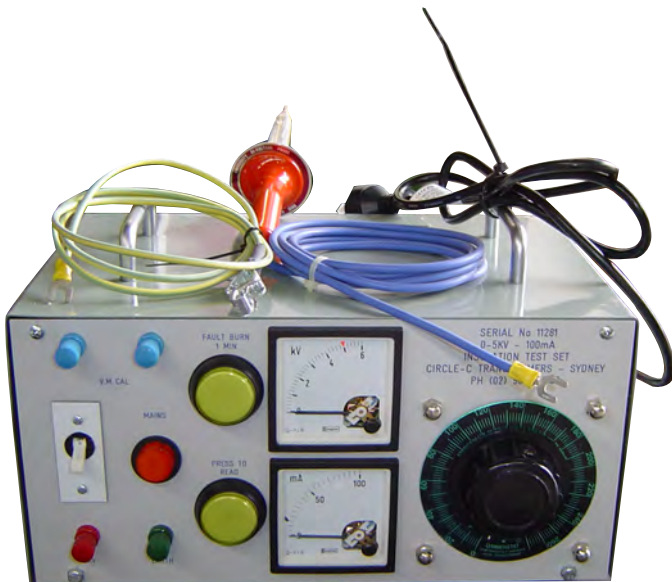
DC CHOKES

- single phase low voltage to 1000V DC
- manufactured to customers specifications when inductance (L) and current (A) is provided
- Supplied open (IP00) or enclosed as IP21, IP23, IP33, IP42, IP43, IP55 or IP56
- Designed, manufactured to AS1028 and international standards



TEST EQUIPMENT

- These instruments can be utilised for insulation breakdown tests and leakage tests on:-
 - Capacitors, coils & relays etc.
 - Cables
 - Electrical Appliances
 - HV resistors
 - Rectifiers
 - Transformers & motors
 - Switchboards
- Standard models 0-5kV and 0-10kV at 100mA complete with instruments, circuit breaker and fault burn function, housed in a portable robust construction enclosure.
- Special models 0-100kV at 100mA with an instrument & control equipment panel with separate enclosed oil filled free standing High Voltage transformer including HV bushing and secondary LV terminals.
- Rail Corp 1500DC Drop Out Test Box



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