Digital Time Switches *Crono*® & *Pulse*

- Precise time programming for Daily/Weekly/Pulse switching
- 25 ON/OFF programs
- Weekend Exclusion (FRI SAT or SAT SUN) and Weekly OFF programming
- LED Indication of Relay status

- 12/24 h display formats
- 6 Years Battery reserve
- Simple Reset & Manual override
- Settable DST & Keypad Lock Feature

Ordering Information

Cat. No.	Description
67DDT0	110 - 240 VAC, Digital Time Switch - Crono, 1 C/O
6GHDT0	24 VDC, Digital Time Switch - Crono, 1 C/O
69HDT0	12 VDC, Digital Time Switch - Crono, 1 C/O
67DDT9	110 - 240 VAC, Digital Time Switch - Pulse, 1 C/O
6GHDT9	24 VDC, Digital Time Switch - Pulse, 1 C/O
69HDT9	12 VDC, Digital Time Switch - Pulse, 1 C/O

Digital Time Switches *Crono®* & *Pulse*

Cat. No.	67DDT0 (*Crono®*)		67DDT9 (*Pulse*)
Parameters			
Supply Voltage	110 - 240 VAC		
Supply Variation	-20 % to +10%		
Frequency	50/60 Hz		
Power Consumption (Max.)	6 VA		
Number of Programs	25 ON/OFF Programs		16 Pulse Programs
Minimum Switching Time	1 min		1 s
Pulse Duration	N A		1 to 59 s (Programmable)
Number of Operating Modes	5		3
Description of Modes	• AUTO - Program Run • ON AUTO - Instant ON up to next Auto Event • AUTO OFF - Instant OFF up to next Auto Event • ON - Continuous ON • OFF - Continuous OFF		• AUTO - Program Run • ON - Continuous ON • OFF - Continuous OFF
Display	3 Lines Text LCD		
DST	Programmable		
Clock Accuracy	± 2 s/day max. over the Operating Temperature range		
Power Reserve from Factory	6 Years		

	Output				
Output	Relay Output	1 C/O			
	Contact Rating	16A (For 'NO') & 5A (For 'NC') @ 240 VAC / 24 VDC (Resistive), Inductive (cos ø = 0.6):- 6 A @ 250 VAC			
	Electrical Life	3×10^4			
	Mechanical Life	5×10^4			

Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V, Rated Current (Ie): 3/1.5 A
	DC - 13	Rated Voltage (Ue): 24/125/250 V, Rated Current (Ie): 2.0/0.22/0.11 A

Operating Temperature	-10°C to + 55°C
Storage Temperature	-10°C to + 60°C
Humidity (Non Condensing)	95% (Rh)
LED Indication	Red LED → Relay ON
Enclosure	Flame Retardant UL94-V0
Dimension (W x H x D) (in mm)	36 X 90 X 65
Weight (unpacked) Approx.	110 g
Mounting	Base / DIN rail
Certification	CE c(UL)us LISTED RoHS Compliant
Degree of Protection	IP 20 for Terminals, IP 40 for Enclosure

EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

Applications	Ideal for Lighting applications like street lighting, Advertising Displays, Glowsigns. Also can be used for Air conditioners / Coolers, Geysers, conveyors, pumps etc.	Ideal for Siren, Bell applications

Astronomical Time Switch *Astro® Mini*

- Astronomical Time Switch in 35mm
- Latitude/Longitude precise to the minute with time zone
- Sunrise/Sunset or Twilight rise/set trigger modes
- Ease of Programming & Navigation

- DST, Offset, OFF Hours, Weekly OFF features
- 12/24 Hour display format
- 6 years Battery reserve
- Easy Manual Override & Keypad Lock feature
- Ideal for Outdoor & Street lighting applications

Ordering Information

Cat. No.	Description
T2DDT7	110 - 240 VAC, Astronomical Time Switch - Astro Mini, 1 C/O
T2DDT8	110 - 240 VAC, Astronomical Time Switch - Astro Mini, 1 C/O (With Pre-defined City codes)

Astronomical Time Switch *Astro*® *Mini*

Cat. No.	T2DDT7
Parameters	
Supply Voltage (⏣)	110 - 240 VAC
Supply Variation	-20 % to +10% (of ⏣)
Frequency	50/60 Hz
Power Consumption	6 VA
Programming	Based on Latitude/Longitude precise to the minute with time-zone
Trigger Modes	Sunrise/Sunset or Twilight Rise/Set
Offset	1 min to 10 hr 59 min (Programmable)
OFF Hours	Programmable
Weekly Off	User Defined
DST	User Defined
Number of Operating Modes	3
Description of Modes	• AUTO ‐ As per user defined program settings • ON AUTO ‐ Instant ON up to next Auto Event • AUTO OFF ‐ Instant OFF up to next Auto Event
Minimum Switching Time	1 min
Display	3 Lines Text LCD
Clock Accuracy	± 2 s/day max. over the Operating Temperature range
Power Reserve from Factory	6 Years

Output	Relay Output	1 C/O
	Contact Rating	16A (For 'NO') & 5A (For 'NC') @ 240 VAC / 24 VDC (Resistive), Inductive (cos ø = 0.6) :- 6 A @ 250 VAC
	Electrical Life	3×10^4
	Mechanical Life	5×10^4

Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V, Rated Current (Ie): 3/1.5 A
	DC - 13	Rated Voltage (Ue): 24/125/250 V, Rated Current (Ie): 2.0/0.22/0.11 A

Operating Temperature	-10°C to + 55°C
Storage Temperature	-10°C to + 60°C
Humidity (Non Condensing)	95% (Rh)
LED Indication	Red LED → Relay ON
Enclosure	Flame Retardant UL94-V0
Dimension (W x H x D) (in mm)	36 X 90 X 65
Weight (unpacked)	110 g
Mounting	Base / DIN rail
Certification	CE RoHS Compliant
Degree of Protection	IP 20 for Terminals, IP 40 for Enclosure

EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

Applications	Street lighting applications in cities, industrial townships, university campuses Lighting automation in sports complex, hotels, parks & other outdoor applications.

Astronomical Time Switch *Astro*®

- Dynamic and Accurate control based on Astronomical Mathematics
- Sunrise / Sunset or Twilight rise / set trigger
- Yearly programming with Season mode, DST, Offset, OFF hours, Weekly Off features
- Protection against Under Voltage and Over Voltage
- Alternate Mode with Auto Load Changeover feature

- Three Independent channel outputs
- Active Phase selection
- Manual override facility
- Single phase and Three phase versions
- Modbus Communication
- User friendly software for device configuration

Ordering Information

Cat. No.	Description
T2DDT0	110 - 240 VAC, Single Phase Astronomical Time Switch - Astro, 2 NO
T3DDT0	110 - 240 VAC, Three Phase Astronomical Time Switch - Astro, 3 NO
TGDDT6	Windows based Application software for Astro
GFDNN3M	Memory Card
GFDNN2S	RS 232 Serial Interface Cable
GFDNN1	USB Interface Cable

Astronomical Time Switch *Astro*®

Cat. No.	T2DDT0	T3DDT0
Parameters		
Supply Voltage (⏀)	110 - 240 VAC	110 - 240 VAC (3 Phase, 4 Wire)
Supply Variation	-20 % to +10% (of ⏀)	
Frequency	50/60 Hz	
Programming	Based on Latitude/Longitude precise to the minute with time-zone	
Trigger Modes	Sunrise/Sunset or Twilight Rise/Set	
Offset	1 min to 10 hr 59 min (Programmable)	
OFF Hours	Programmable	
Weekly Off	User Defined	
Alternate Mode	Yes	
Seasonal Mode	User Defined	
DST	User Defined	
Number of Operating Modes	3	
Mode Description	• AUDO - As per user defined program settings • ON AUTO - Instant ON up to next Auto Event • AUTO OFF - Instant OFF up to next Auto Event	
Minimum Switching Time	1 min (1s for Pulse)	
Display	Backlit LCD	
Under Voltage Trip Level	N A	0 - 220 V (Settable)
Over Voltage Trip Level	N A	130 - 330 V (Settable)
Trip Time	N A	5 - 16 sec
Recovery Time	N A	1 - 4 sec
Clock Accuracy	± 1 s/day max. over the Operating Temperature range	
Power Reserve from Factory	6 years	

Output	Relay Output	2 NO	3 NO
	Contact Rating	8A @ 240 VAC & 5A @ 30 VDC (Resistive)	
	Electrical Life	1×10^5	
	Mechanical Life	1×10^7	

Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V, Rated Current (Ie): 3/1.5 A
	DC - 13	Rated Voltage (Ue): 24/125/250 V, Rated Current (Ie): 2.0/0.22/0.11 A

Operating Temperature Storage Temperature	-10°C to + 50°C -10°C to + 60°C	
Humidity (Non Condensing)	95% (Rh)	
Enclosure	Flame Retardant UL94-V0	
Dimension (W x H x D) (in mm)	72 X 90 X 65	
Weight (unpacked)	190 g	208 g
Mounting	Base / DIN rail	
Certification	CE c(UL)us LISTED RoHS Compliant	
Degree of Protection	IP 20 for Terminals, IP 40 for Enclosure	

EMI / EMC

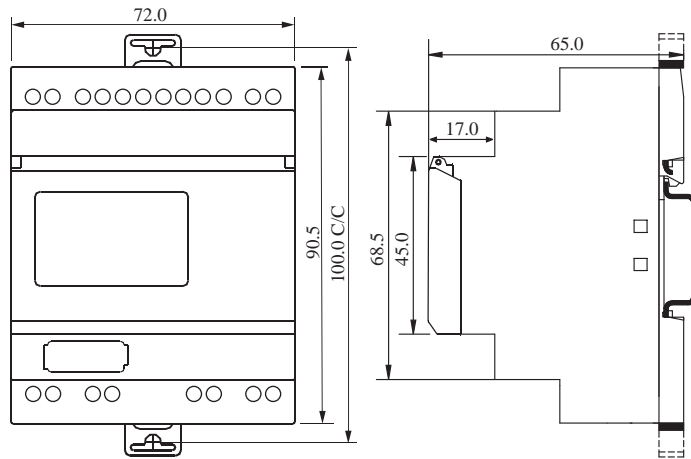|	
Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

Environmental

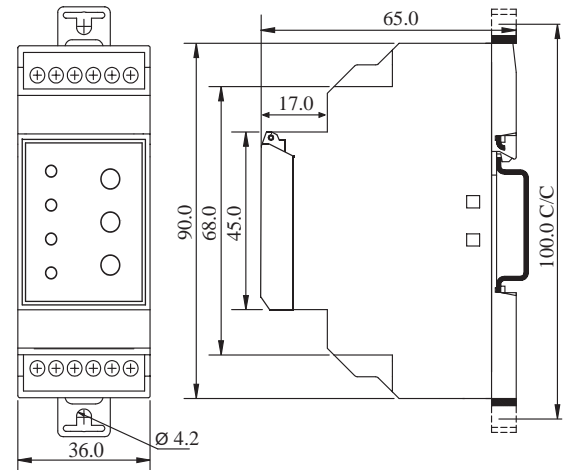|	
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

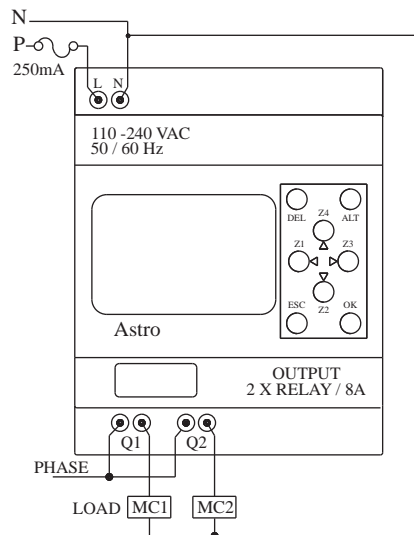# Astronomical Time Switch *Astro*®

MOUNTING DIMENSION (mm)

Astro®

72.0

90.5
100.0 C/C

65.0
17.0
68.5
45.0

T2DDT0, T3DDT0

Crono®, Pulse & Astro® Mini

65.0
17.0
90.0
68.0
45.0
100.0 C/C

36.0
Ø 4.2

67DDT0, 67DDT9, T2DDT7, T2DDT8

CONNECTION DIAGRAM

N
P
250mA
L   N

110 -240 VAC
50 / 60 Hz

DEL   Z4   ALT
Z1   Z3
ESC   Z2   OK

Astro

OUTPUT
2 X RELAY / 8A

Q1   Q2
PHASE
LOAD   MC1   MC2

T2DDT0, T3DDT0
MC1, MC2, MR, MY, MB: CONTACTOR COILS

N
B Ph
Y Ph
R Ph   250mA

R   Y   B   N

110 - 240 V Ph - N AC [3Ph 4 Wire]
50 / 60 Hz

DEL   Z4   ALT
Z1   Z3
ESC   Z2   OK

Astro

OUTPUT
3 X RELAY / 8A

Q1   Q2   Q3
R Ph   Y Ph   B Ph
MR   MY   MB

L/+   N/-

18   15   16
L/+
Load
N/-
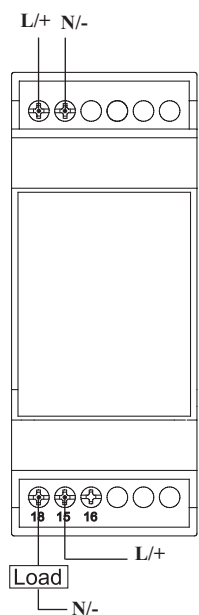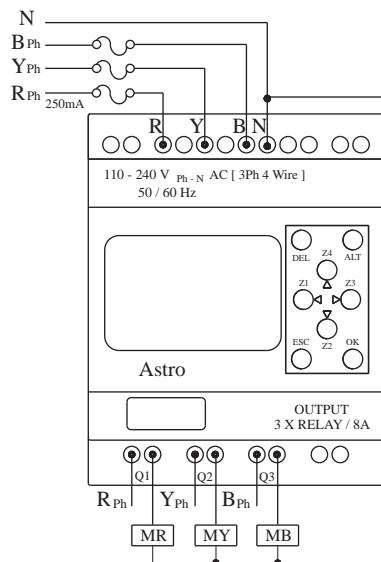
67DDT0, 6GHDT0, 6GHDT9, 67DDT9,
69HDT0, 69HDT9, T2DDT7, T2DDT8

TERMINAL TORQUE & CAPACITY

Ø 3.5...5.0 mm	Torque - 1.1 N.m (10 Lb.in) Terminal screw - M3.5
	Solid Wire - 2 X 0.2...2.5 mm²
AWG	1 X 24 to 10

T2DDT0, T3DDT0, T2DDT7, T2DDT8, 67DDT0, 67DDT9

Lighting Automation with *Astro®* using GSM Technology

- Most of the "ASTRO" parameters can be set remotely using SMS queries. I.e. Output mode, Offset Hrs etc, UV, OV settings.

- Relay Output can be override remotely using SMS query.

- Energy Meter Functionality. Parameter like Load current, Supply voltage, Power, Energy can be known remotely.

- With the help of "Auto Error Code Update" following onsite error can be know remotely during output event.
  - Under Voltage
  - Over Voltage
  - Over Current
  - Output actuator short.
  - Load Open

Ordering Information

Cat. No.	Description
19D2000C	Surge Suppressor
19D20B00	Astro GSM Module (GSM-ERT5), Remote Side
19A1000B	Communication Cable (TTL-TTL) between Astro & GSM Module
TGDDT6	Windows based application software for Astro

Lighting Automation with *Astro*® using GSM Technology

Cat. No. | 19D20B00 (ERT 5)

Parameters	
Supply Voltage (⊕)	240 VAC (3 Phase, 4 Wire)
Supply Variation	-30% to +25% (of ⊕)
Frequency	50/60 Hz
Active Phase selection	Yes
Operating Temperature	-15℃ to + 60℃
GSM Type	Dual band 900 / 1800 GSM
GPRS Packet data	Class 10 coding scheme
AT cCommand set Suitabiltiy	N. A.
SMS Type Functionality	Data Call through GSM, SMS
SIM Holder	Text, Cell Broadcast
Antenna	Connected with the product
Antenna Impedance	50 Ω
Energy Measurement	Yes
Energy Measurement Accuracy	Class 0.5
Current Sensing Range	5A
CT Ratio	Settable up to 40
LED Indications	Tx, Rx, Network, Power, Pulse Out
Pulse Out rate	3200 pulses / kWh
Auxiliary Output	12 V DC, 200 mA
Mounting	Base / DIN Rail
Enclosure	Flame Retardant UL94-V0
Dimension (W x H x D) (in mm)	72 X 90 X 67
Weight (unpacked)	190 g
Certification	CE RoHS Compliant

EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

Environmental

|	
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

Note:
1. ERT5 can measure maximum 5A & 1A current respectively.
2. Maximum current measurement limit for ERT-5 is 200A.
Ex: 1. For CT selection if current required to be measured is upto 200A then CT of 200:5 A (CT ratio 40) needs to be used.

Lighting Automation with *Astro*®
using GSM Technology

• Maximum 5 valid users can access the system remotely, using GSM functionality.

• To avoid Remote module's SIM theft, "SIM PIN" facility can be enabled remotely using SMS query.

• To avoid changes in system configuration by unauthorized user amongst valid users, important SMS
  queries are provided with "MODULE PIN" lock.

• Device supports for 12 to 14 digit mobile number. i.e. (10 Digit Mobile number + 2/3/4 digit country code).

CONNECTION DIAGRAM
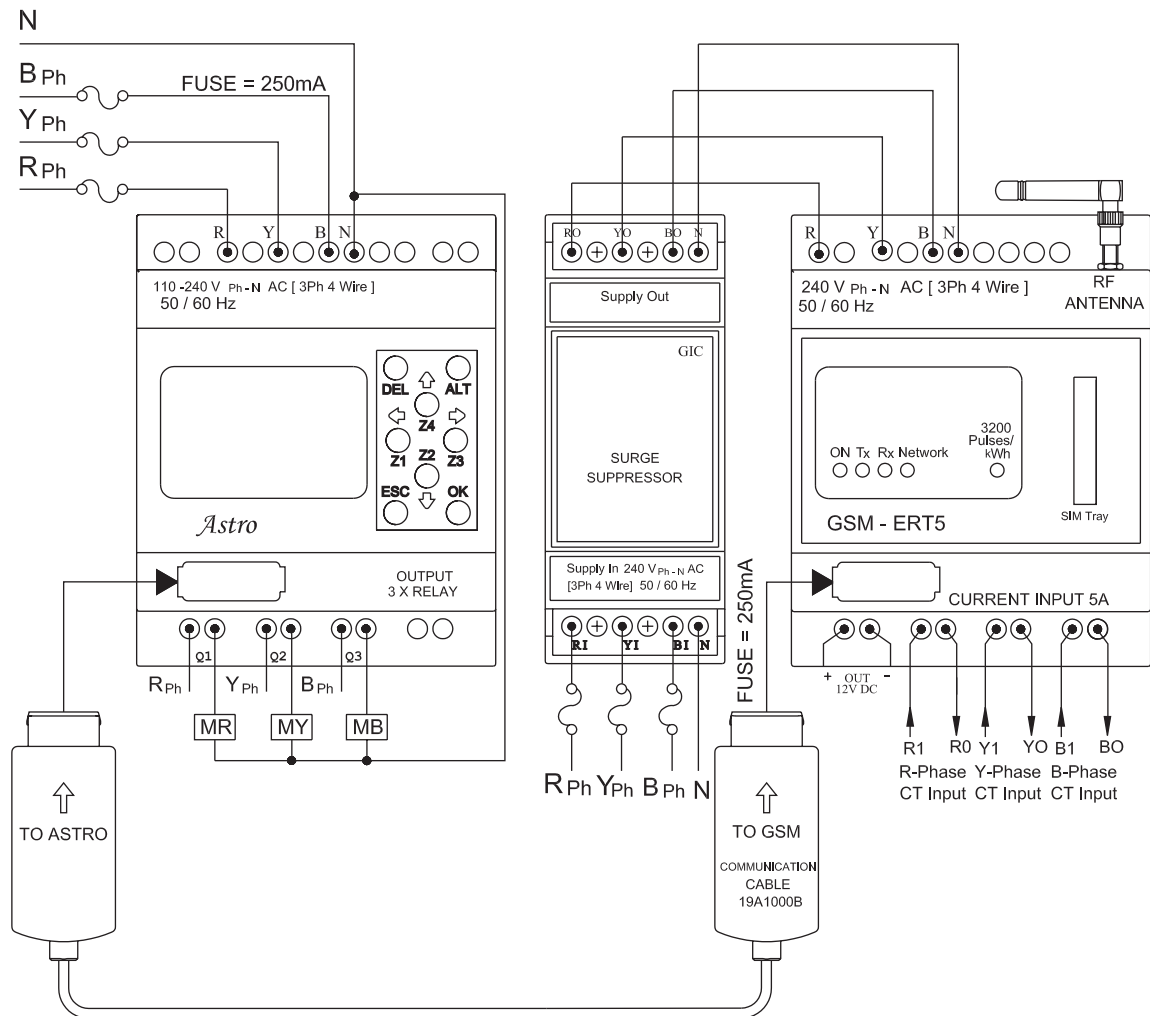
1. MR: - Coil of Contactor 1
2. MY: - Coil of Contactor 2
3. MB: - Coil of Contactor 3
4. MRC1: - NO of Contactor 1
5. MRC2: - NO of Contactor 2
6. MRC3: - NO of Contactor 3
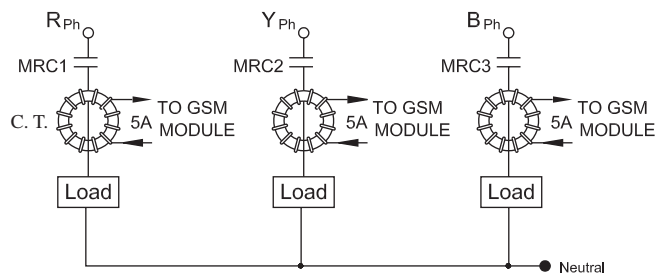
TERMINAL TORQUE & CAPACITY

Ø 3.5...5.0 mm	Torque - 1.1 N.m (10 Lb.in) Terminal screw - M3.5
	Solid Wire - 2 X 0.2...2.5 mm²
AWG	1 X 24 to 10

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