



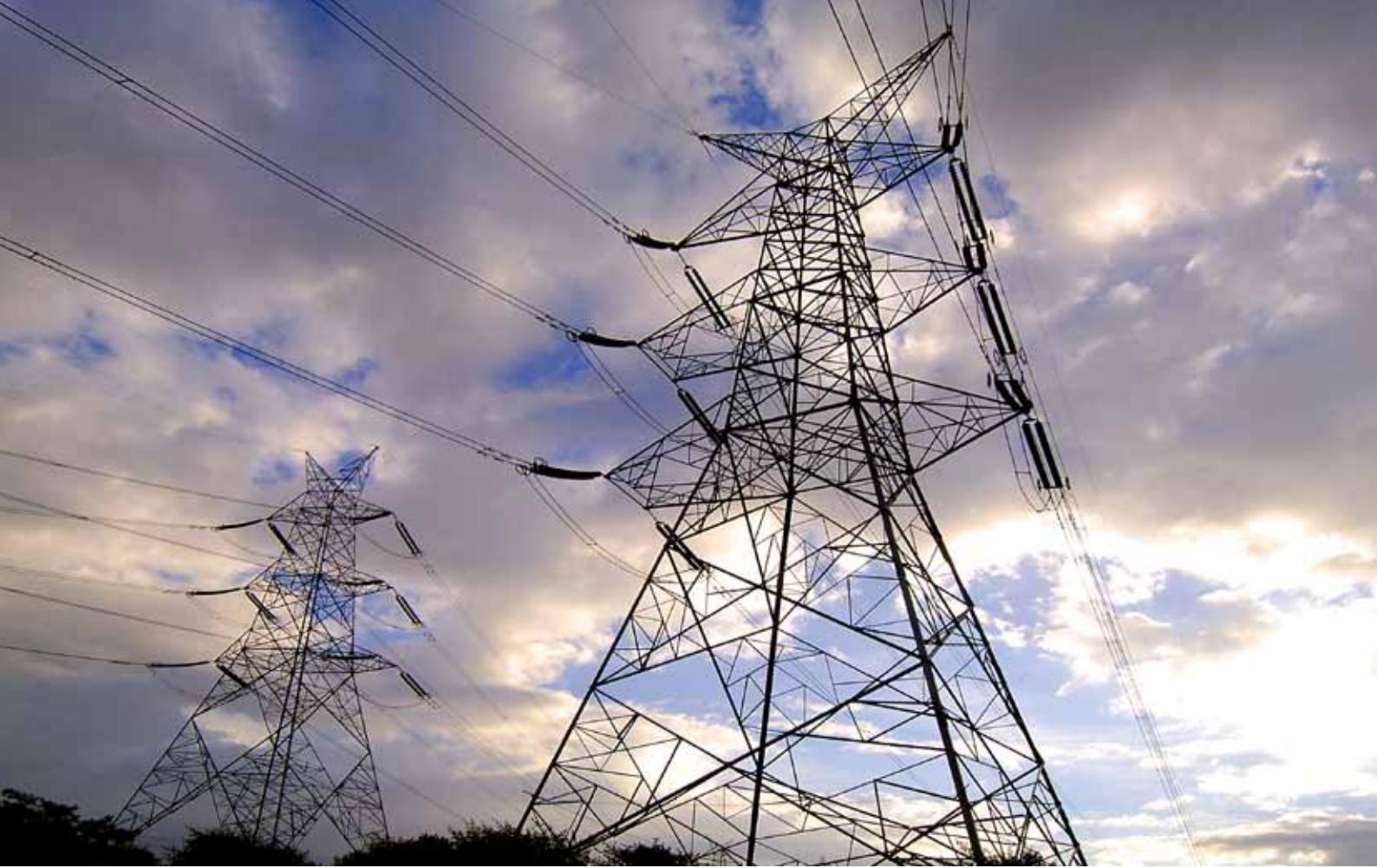
Smart. Easy. Reliable.

**Automatic Power Factor Controller Relay
7UG05 for optimized power need.**

www.siemens.co.in

7UG05 Automatic power factor correction relay

- Controls the required Power factor
- Manage capacitor bank switching
- Monitors power quality
- Communication capable



Smart. Easy. Reliable.

The increasing demand of electrical power and the awareness of the necessity of energy saving is growing these days. Also the awareness of improvement and enhancing power quality by means of improvement of power factor is catching up, as there are different incentive schemes rolled out by the governments in these directions.

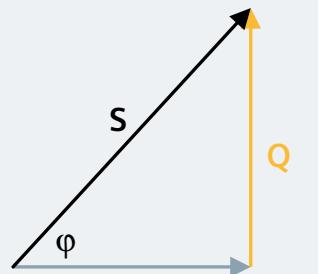
In power distribution, low- and medium-voltage networks, Power factor correction focuses on the power flow ($\cos \phi$) and the optimization of voltage stability by generating reactive power – to improve voltage quality and reliability at distribution level. Reactive Power Compensation or Power Factor Correction is the simplest way of improving efficiency of the electrical energy and generating savings by energy conservation.

Electrical devices, e.g. motors, need active power and reactive power. Active power is converted into mechanical power or heat losses, reactive power is needed to maintain the magnetic fields of the devices. Vector addition of active power P & reactive power Q gives the apparent power S. This means, that generators, transformers, power lines, switchgear, etc. must be sized for greater power ratings than the load which draws active power. If the lagging power factor is corrected, for example by installing a capacitor at the load, this totally or partially eliminates the reactive power draw at the power supply.

Apparent power
 $S^2 = P^2 + Q^2$

Active power
 $P = S \cos \phi$

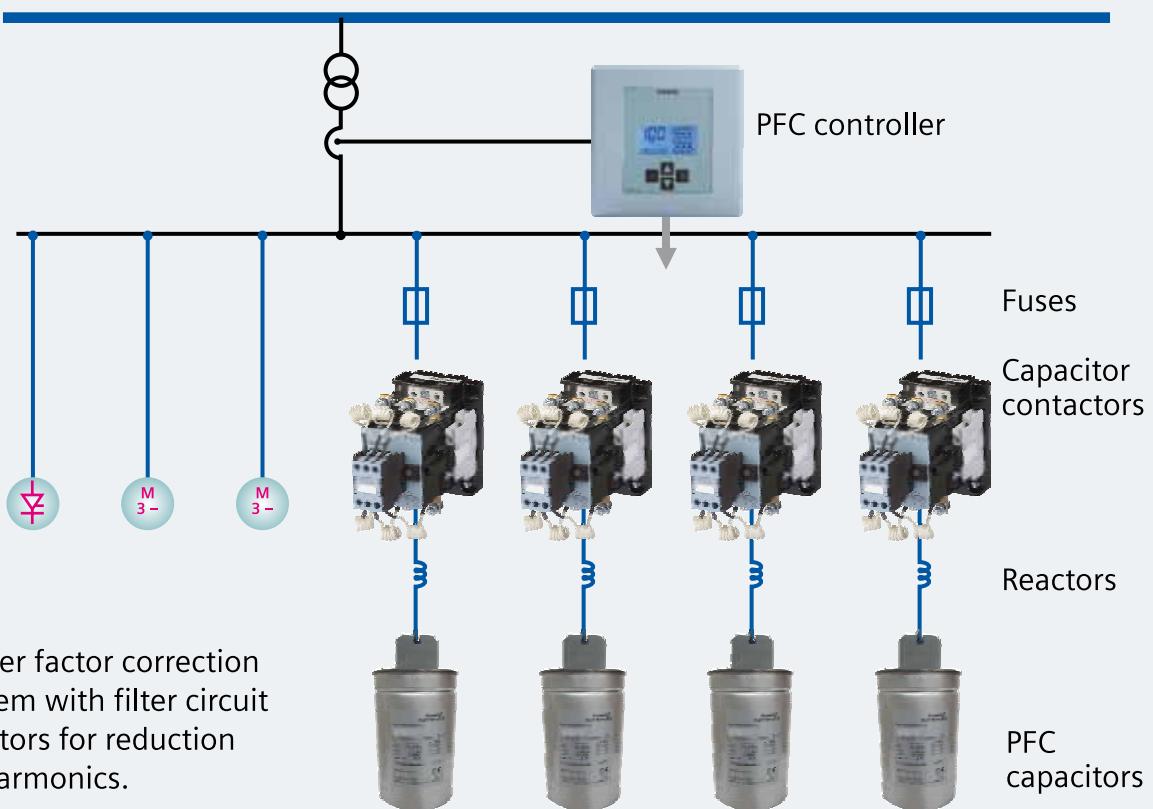
Reactive power
 $Q = S \sin \phi$



With the systematic use of power factor correction,

- Energy losses in the electrical transmission and distribution networks can be significantly reduced, with a corresponding reduction in the CO₂ emissions involved in generating that lost energy;
- Energy transmission and distribution networks can be used more efficiently
- Reliability of planning for future energy networks can be increased.

Typical power factor correction circuit diagram



Benefits of power factor correction

- Fast return on investment through lower power costs
- Power factor correction reduces the reactive power in a system.
- Power consumption and thus power costs drop in proportion.
- Improved voltage quality, reduced voltage drops
- Optimum cable design – Cable cross-sections can be reduced with improvement of power factor (less current)



The Range

7UG0572-1GT21



- Intelligent 12 stage relay controls
- Confirms to IEC 60947-5-1, carry and
- 4 digit 7 segment LED display
- Universal control supply – optimizing the no of variants
- Automatic / Linear / rotational switching of banks
- Power factor settable-0.8 lag -- 0.8 Lead
- Selectable 1A /5A current input

7UG0572-1GT20



- Intelligent 12 stage relay controls
- Confirms to IEC 60947-5-1, carry and
- Dual colour Backlight LCD display
- Universal control supply – optimizing the no of variants
- Automatic / Linear / rotational switching of banks
- Power factor settable-0.8 lag – 0.8 Lead
- Selectable 1A /5A current input
- Measurement and display of key parameters viz: Voltage, Current, Power factor, THDI etc
- RS485 Communication MODBUS RTU Protocol

7UG0571-1FT20



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- Confirms to IEC 60947-5-1, carry and
- Dual colour Backlight LCD display
- Universal control supply – optimizing the no of variants
- Automatic / Linear / rotational switching of banks
- Power factor settable-0.8 lag -- 0.8 Lead
- Selectable 1A /5A current input
- Measurement and display of key parameters viz: Voltage, Current, Power factor, THDI etc
- RS485 Communication MODBUS RTU Protocol

APFC relay: Technical data

Make		
Type	7UG0571-1FT20 (8 step) / 7UG0572-1GT20 (12 step)	7UG0572-1GT21
STEPS	8 Step & 12 Step	12 Step
Display	LCD with dual color backlight 3 line 4 digit & Programmable Scrolling (Auto / Manual / Default) to show electrical parameters	4 digit 7 segment LED (No display scrolling, only PF is displayed)
INPUT		
Rated operational voltage [Ue]	415V	
Rated Insulation Voltage [Ui]	600V	
Rated Impulse Withstand Voltage [Uiimp]	6kV	
Overvoltage category	III	
Control supply AC	90 to 250 VAC	
Power consumption	15VA	
Frequency HZ	50/60Hz	
Mains		
L-N AC	30 to 250 VAC	
L-L AC	50 to 440 VAC	
Current AC	5A AC	
Frequency HZ	50/60Hz	
Digital input	Yes	NA
Wiring input	3P 4W / 3P 3W / 2P 2W / 1P 2W	
Environment condition		
Temperature (operating)	0°C to +60°C	
Temperature (storage)	-20°C to +60°C	
Humidity	0 % to 95 %, without moisture condensation	
Pollution Degree	PCB: 2 Product: 3	
IP Protection	IP20	
Accuracy		
Voltage	± 0.5% of full range	NA
Current	± 0.5% of full range	NA
Power factor	± 0.01	
Frequency	± 0.1% of full range	NA
Power (KW, KVA, KVAR)	± 1% of full range	NA
Energy (KWh, KVAh, KVArh)	± 1% of full range	NA
Resolution		
Energy (kWh)	0.01k, 0.1k, 1k, 0.01M, 0.1M, 1M	NA
Power factor	For average PF: 0.01 For phase PF: 0.001	0.001
Voltage, current & power	Auto	NA
Measurement parameters		
Power factor	✓	✓
True RMS voltage	✓	x
Current	✓	x
Frequency	✓	x
Power (KW, KVA, KVAR)	✓	x
Energy (KWh, KVArh)	✓	x
Temperature	✓	x

Setting		
Power factor (settable)	0.8 lag --- 0.8 Lead	
Reconnection time (sec)	Reconnection time is same as discharge time	
Step switching time (sec)	1 - 999 (Default is 5 sec)	
Discharge time (sec)	1 - 9999 (Default is 180 sec)	
No voltage release	Instantaneous** (Voltage failure) 90 sec (Voltage restoration)	
Control sensitivity	55 -- 100%	
Switching	Automatic / Linear / rotational	
Control	Automatic / Manual	
CT (programable)	Pri: 1A / 5A upto 9999A Sec: 1A/ 5A	
CT Burden	20 mohms	
PT (programable)	Pri: 100 V - 500KV Sec: 100 V - 500V	NA
Alarm Indication		
% THDI	20 -100% / OFF	NA
Over Voltage AC	(L-N) 50 - 277V (L-L) 85 - 480V	
Under Voltage AC	(L-N) 50 - 240V (L-L) 85 - 415V	
No Voltage	ON / OFF	
Over compensate	ON / OFF	
Under compensate	ON / OFF	
CT Polarity error	ON / OFF	
Step error	20 -- 80% or OFF	
Over Temperature	0--100°C, ON /OFF	NA
Current absent indication	NA	CURR
Fan setting	ON/OFF	NA
Test mode Facility	YES	
Display		
% THDI	20 - 100%	NA for LED variant
Harmonics Resolutions	Upto 31st Harmonics	NA for LED variant
Active Power	4 digit	NA for LED variant
Reactive Power	4 digit	NA for LED variant
Apparent Power	4 digit	NA for LED variant
Voltage	100V - 500KV	NA for LED variant
Current	1 - 9999A	NA for LED variant
Temperature	0 - 100°C	NA for LED variant
Frequency	45 - 65 Hz	NA for LED variant
Power factor	-1.00 to 1.00	
Mechanical		
Mounting	Panel	
Dimension(WxHxD)	144 X 144 X 50 MM	
Net weight	635gms (Final packing with accessories)	610gms (Final packing with accessories)
Termination for Control supply, Measuring circuit, output relays		
Conductor cross section (solid) sq.mm.	1x (0.75 to 2.5) 2x 0.5 to 2x 1.5	1 x (0.75 to 2.5) 2x 0.5 to 2x 1.5
Conductor cross section (stranded with end sleeve) sq.mm.	1 x (0.5 to 2.5) 2x (0.5 to 1.5)	1 x (0.5 to 2.5) 2x (0.5 to 1.5)
Tightening torque	0.5 Nm	0.5 Nm
Termination for RS485, T1, T2		
Conductor cross section (solid / stranded)	1x 0.5	1x 0.5
Tightening torque	0.4 Nm	0.4 Nm
Output		
Relay Contacts	NO, one common point max fuse 6A	
Ie (AC12 @ 250VAC)	5A* @ 250VAC	
Ie (AC15 @ 250VAC)	1A @ 250VAC	
Password protection	YES	
Communication	RS 485 & Modbus-RTU communication	NA
Standards	IEC 60947-5-1	
Markings	CE & RoHS	

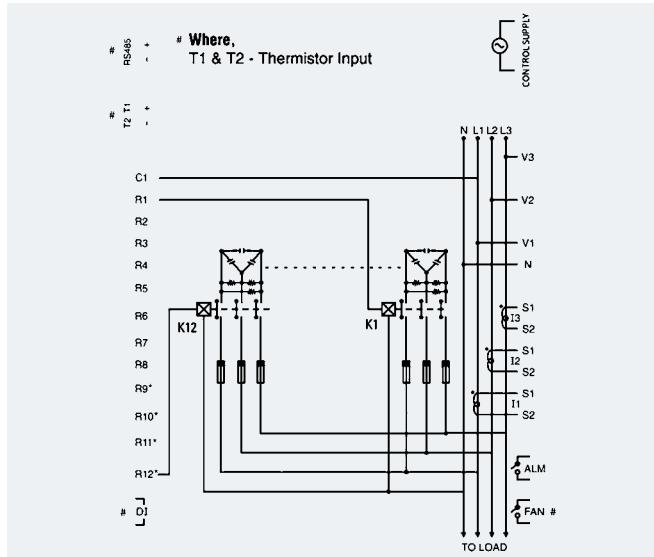
* 5A rating is for each relay contact. If multiple relays are getting switched simultaneously, relay rating will be derated to 1.2A @ 250V

** Response time is 3-5 sec

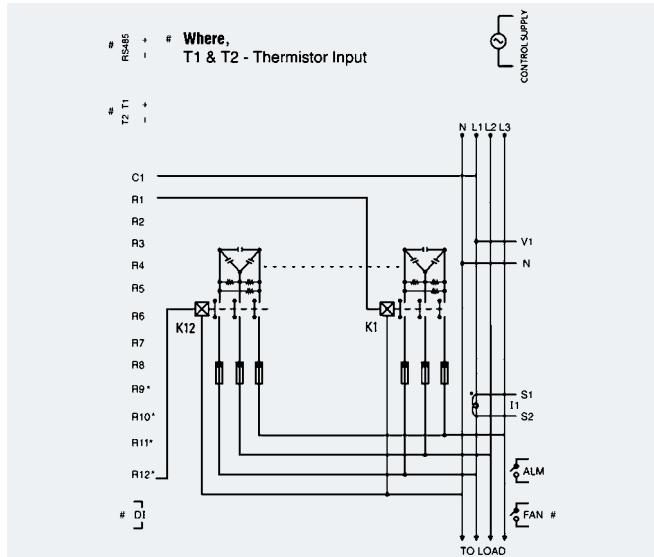
Dimensions and wiring diagram

Wiring Diagram

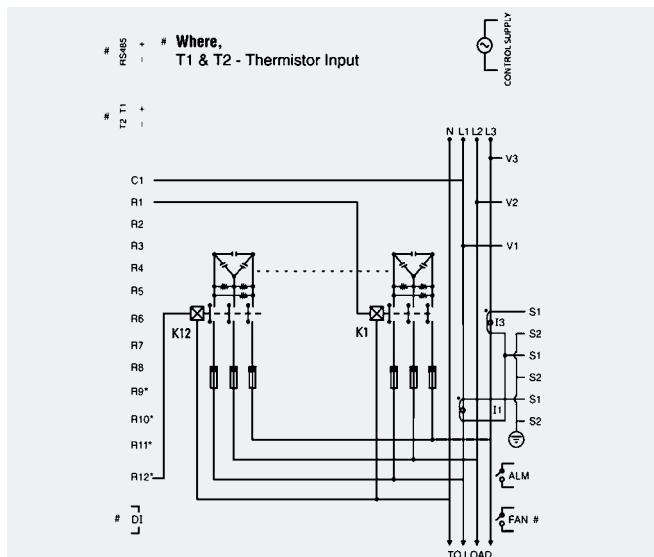
3 Phase - 4 Wire



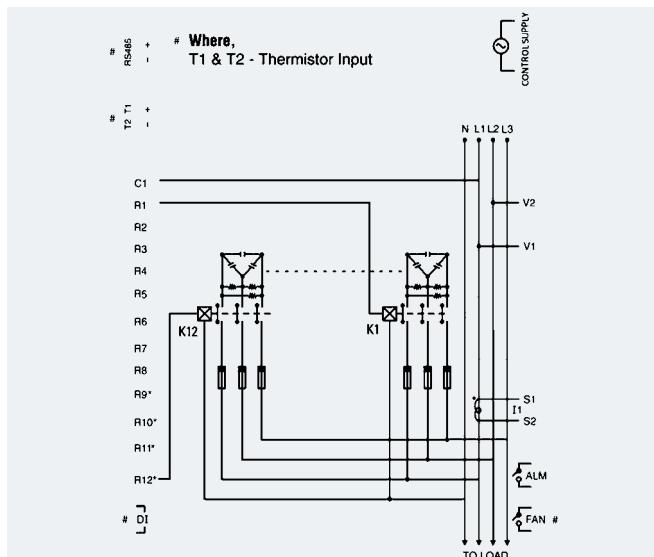
1 Phase - 2 Wire



3 Phase - 3 Wire



2 Phase - 2 Wire



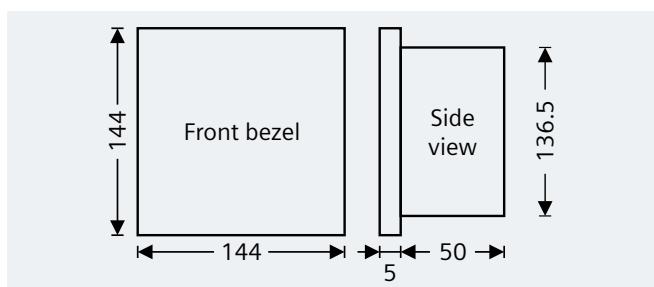
Note:

- For N/W selection 2P2W voltage (V_{LL}) applied between V_1 & V_2 and connect CT for I_1 (Do not use V_3 , N , I_2 & I_3 terminal)
- For N/W selection 1P2W voltage (V_{LN}) applied between V_1 & N and connect CT for I_1 (Do not use V_2 , V_3 , I_2 & I_3 terminal)
- # Only available in 7UG0571-1FT20 & 7UG0572-1GT20 variants

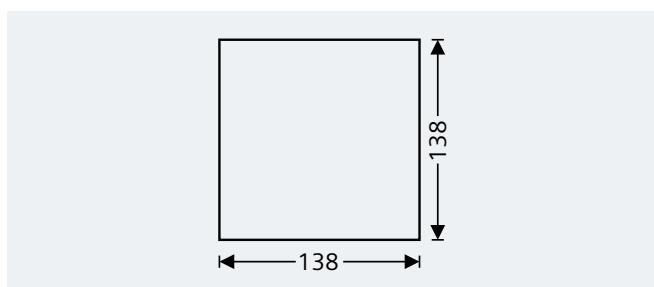
* Not applicable for 7UG0571-1FT20

Dimensional Drawing (mm)

Outline Dimension (in mm)



Panel Cutout (in mm)



Your partners

Sales offices:

Ahmedabad

3rd Floor, Prema Arbour
Girish Coldrinks Cross Roads, Navrangpura
Ahmedabad - 380 009
Fax : +91 79 30927600
Fax: +91 79 30927699

Baroda

Ground Floor, Urja Bhavan
Opp.Makarpura Railway Station, Maneja
Vadodara - 390 013
Fax : +91 265 3957701
Fax: +91 265 3039190

Bengaluru

1st Floor, Jyoti Mahal, No. 49, St. Marks Rd.
Bengaluru - 560 001
Fax : +91 80 33422000
Fax: +91 80 33424131

Chandigarh

SCO 188/191, 3rd Floor, Sector-17 C
Chandigarh - 160 017
Fax : +91 172 4690300
Fax: +91 172 4690399

Territory managers:

Agra

Mobile: +91 7665590 333
E-mail: jain.nitin@siemens.com

Angul

Flat No. 209, Block - B, 2nd Floor
OM Residency, Gandhi Marg
Infront of Kalyani Nursing Home
Angul, Odisha - 759122
Mobile: +91 9437114662
E-mail: sudipta.garnayak@siemens.com

Aurangabad

Mobile: +91 9823011883
E-mail: vineet.saxena@siemens.com

Belgaum

H.No. 12, Nanekar Lane, Sharupur
Belgaum - 590003, Karnataka
Tel.: +91 0831 2495156
Mobile: +91 9740277991
E-mail: anand.gawade@siemens.com

Belgaum

Flat No. 7, 2nd Floor, Jyotirling Plaza
Congress Road, Thikswadi
Belgaum - 590011, Karnataka
Mobile: +91 7259400100
E-mail: prathish.t_m@siemens.com

Belgaum

1st Floor, H No. 297, Shivachandra Niwas
3rd Cross Baghaya Nagar Angol Extension
Belgavi, Karnataka - 590006
Mobile: +91 810524395
E-mail: siddu.maregudi@siemens.com

Bharuch

Gold B, 804, Samruddhi Residency
Opp. Zadeswar Bus Stop, Zadeswar Road
Bharuch - 392011
Mobile: +91 9429037805
E-mail: kalpeshkumar.darji@siemens.com

Bhilai

C/o. Mr. Anil Dhusia, Qtr. No. 4A, Street 33
Sector-4, Bhilai - 490001
Mobile: +91 7869922211
E-mail: pravin.deshpandharat@siemens.com

Bhopal

Flat No. 103, Multi "E" Star, Sagar Royal Villas
Nr. Ashima Mall, Hoshangabad Road
Bhopal (MP) - 462026
Mobile: +91 9677400915
E-mail: dinesh.prapatji@siemens.com

Bhubaneswar

104 Sector 5, Niladri Vihar
Chitrapurapur, Bhubaneswar
Odisha - 751021
Mobile: +91 7399638488
E-mail: ravi.modi@siemens.com

Bhubaneswar

Plot No. 233, Shahid Nagar
Bhubaneswar - 751007
Mobile: +91 7894463673
E-mail: somnath.manna@siemens.com

Bhubaneswar

Plot No. 486, Flat No. 302
Archid Royal Apartment, Nageswar Tangi
Bhubaneswar - 751002, Odisha
Mobile: +91 9040001343
E-mail: pm.barki@siemens.com

Boisar

Flat No. A-21, Sai Sagar CHS
MAHADA Colony, Chitrayala Road
Boisar - 401506
Mobile: +91 9819231892
E-mail: debashis.biswas@siemens.com

Cochin

Jomer Symphony, 33/217, 5th Floor
Chakkavattom, Ponnurunni North, Vytilla
Kochi - 682019
Tel.: +91 942861122
Mobile: +91 9846006580
E-mail: girish_nair@siemens.com
Mobile: +91 926065551
E-mail: abhishek.tyagi@siemens.com
Mobile: +91 9656690111
E-mail: vinu.pillai@siemens.com

Durgapur

6/15, Bengal Ambuja
(Near Durgapur Cinema Hall)
Citi Centre, Durgapur - 713216
Mobile: +91 9830317456
E-mail: harsh.chincholkar@siemens.com
Mobile: +91 9051020207
E-mail: sayantan.ghosh@siemens.com

Siemens Ltd.

Digital Factory
Control Products

R&D Technology Centre

Kalwa Works, Thane Belapur Road, Thane - 400 601
Fax: +91 22 33265627

For more information contact toll free 1800 209 1800
E-mail: lvsgr-mktg.india@siemens.com

www.siemens.co.in

Chennai

4th Floor, ETA Mount Central
Seethakathi Business Centre, Mount Road
Chennai - 600006
Fax: +91 44 30474000
Fax: +91 44 30474080

Coimbatore

1st Floor, "Senthil Towers"
1078, Avinashi Road
Coimbatore - 641018
Fax: +91 422 3076300
Fax: +91 422 3076310

Gurgaon

Plot No. - 78, Tower - B
Jagatjit Industries Building (JIL)
Opposite SBI Academy, Sector-18
Gurgaon - 122015
Fax: +91 124 2842000, 3810200

Gandhidham

Plot No. 299, Ward 3A, Adipur
Gandhidham - 370205, Gujarat
Mobile: +91 9999010323
E-mail: vismay.pandyal@siemens.com

Goa

Hous No. S-2, Classque Appartment
Porvorim, Goa - 403501
Mobile: +91 7722008113
E-mail: jithin.jacob@siemens.com

Gorakhpur

Flat No. 13, 3rd Floor, Plot No. 298
Near Sawatri Hospital, Puriplur
Vijay Chowk, Gorakhpur - 273001, UP
Mobile: +91 7259661717
E-mail: anirudh.ganta@siemens.com

Guruvati

House No. 20, Ushanagar
Dispur Supermarket
Guwahati - 781006, Assam, India
Mobile: +91 9874844442
E-mail: subhajit.majumder@siemens.com

Hariyuan

Plot No. 38, House No. 229/20
Deep Gangi Apartments, Sector - 5A
SIDCUL, Hariyuan - 249403, UP
Mobile: +91 98176012434
E-mail: shagun.gupta@siemens.com

Hospet

1st Floor, H No. 297, Shivachandra Niwas
1st Main, Nehru Co-Op Colony
Hospet - 583203, Karnataka
Mobile: +91 9901400227
E-mail: amitava.Mondal@siemens.com

Hudwari

Plot No. 38, House No. 229/20
Deep Gangi Apartments, Sector - 5A
SIDCUL, Hariyuan - 249403, UP
Mobile: +91 98176012434
E-mail: shagun.gupta@siemens.com

Hospt

Mahima's, Door No. 1288, 9th Ward
Near Markendeshwar School
M.P.Raksha Nagar
Hospet - 583203, Karnataka
Mobile: +91 9945859004
E-mail: nagaraj.rk@siemens.com

Hospt

727, Lakshmi Narasimha Nilaya
Near Subhali Kalyana Mantapa, Amaravathi
Hospet - 583203
Mobile: +91 9741114877
E-mail: naveen.s@siemens.com

Hosur

Plot No. 10 Vishnu Anandam Galaxy
Chittanapalli Nallur Village, Hosur - 635109
Mobile: +91 9712002266
E-mail: dinesh.rajaian@siemens.com

HUBLI

Plot No. 9, Abhi Nilay
Manjunath Nagar, Gulok Road
Hubli - 540 010
Mobile: +91 9945961052
E-mail: kiran.kage@siemens.com

Indore

C/o Mr. Mahendra Nandedkar
Plot No. CH-30, Scheme No. 74
Vijay Nagar, Non Prestige College
Indore - 452016
Mobile: +91 9049149199
E-mail: kulkarni.shridhar@siemens.com

Indore

Mobile: +91 9823011883
E-mail: vineet.saxena@siemens.com

Jajpur

Kirtan Enclave, Flat No. 316, C Block
Chhordha Chaak, Jajpur Keonjhar Road
Jajpur, Odisha - 755019
(Nearest Land Mark - SBI ATM counter)

Mobile: +91 9937189624
E-mail: probir.mukherjee@siemens.com

Jalandhar

H.No. 140, Ground Floor, Defence Colony
Jalandhar, Punjab - 144001
Mobile: +91 8427979870
E-mail: himanshu kaushik@siemens.com

Hyderabad

5-9-19, 4th & 5th Floor
Laxmi Narasimha Estate
Opp. Secretariat Road
Safipabad
Hyderabad - 500 004
Fax: +91 40 30922500
Fax: +91 40 30923145

Jaipur

6, Park Street
Opp. Pink City Petrol Pump
M.I.Road
Jaipur - 302 006, Rajasthan
Fax: +91 141 5151208
Fax: +91 141 2370482

Jamshedpur

"Roshan Tower"
Main Road, Bistupur (2nd Floor)
Jamshedpur - 831001
Fax: +91 657 6682201

Kolkata

3rd Floor, 43, Shanti Palli
Rashbihari Bypass Connector
Kolkata - 700042, India
Fax: +91 33 30939000

Lucknow

510-511, 5th Floor, Shalimar Titanium
Plot No. TC-G-1/1, Vibhuti Khand
Gomti Nagar, Lucknow
Uttar Pradesh - 226010
Fax: +91 522 4031039

Mumbai

Business Centre-1
Thane Belapur Road, Thane - 400 601
Fax: +91 22 39663000
Fax: +91 22 39663721

Nagpur

5th Floor, Land Mark Building
Wardha Road, Ramdas Peth
Nagpur - 440 010
Fax: +91 712 3093111

Pune

Tower B/701-705, ICC Trade Tower
403A, Senapati Bapat Road
Pune - 411016
Fax: +91 20 30466000

Vishakhapatnam

2nd Floor, 30-8-47
Lakshmi Narasimha Towers
Bank Street, Daba Gardens
Visakhapatnam - 530 020
Andhra Pradesh
Fax: +91 891 3050200
Fax: +91 891 3050222

Rudrapur

Flat No. 202, Tower Indus 'B'
Omaxe Reviere Ltd.
Rudrapur - 263153, Uttarakhand
Mobile: +91 9918002525
E-mail: atul.shukla@siemens.com

Rudrapur

Flat No. 104, Tower Rhone 'C'
Omaxe Reviere Ltd.
Rudrapur - 263153, Uttarakhand
Mobile: +91 6210701111
E-mail: abhinav.rastogi@siemens.com

Salem

Flat No. F111, Anantraj Ashray Apartment
Plot No. 236, Japanese Zone
Neemrana - 301705, Dist.- Alwar
Mobile: +91 9650481919
E-mail: deepak.benival@siemens.com

Siliguri

C/o. Radhagobindo Paul
Sayed Mustafa Ali Road
Raja Rammohan Road, Hakimpura
Kundrath Road, Siliguri - 741201
Mobile: +91 9932276294
E-mail: dibyoyoti.karmakar@siemens.com

Sonepat

H.No. 1103, 1st Floor, Sector-14
Sonepat, Haryana - 131001
Mobile: +91 9855621622
E-mail: kumar.manish@siemens.com

Sriperumbudur

C-32 Block, 3rd Floor, Flat No. 31
TVH Svaya Apartments, Nir Vendu Villaage

Kundrath Road, Sriperumbudur - 620105
Mobile: +91 9884102638
E-mail: venkatesh.janakiraman@siemens.com

Surat

3/A, Navrachana Society, Opp. D.K.Park
Bhatar Road, Surat - 395001
Mobile: +91 9875910191
E-mail: mitul kapadia@siemens.com

Surat

A-604, Stuti Universal, Green City Road
Pal-Adajan, Surat - 395009, Gujarat
Mobile: +91 9712445504
E-mail: harshwardhan.mishra@siemens.com

Trichy

Mobile: +91 8056025127
E-mail: ponnivalavan.p@siemens.com

Trivandrum

House No. 30, Ganga Nilayam
Swathy Nagar, Kazhakutom
Trivandrum - 695528
Mobile: +91 9947957839
E-mail: nobin.babu@siemens.com

Udaipur

A-39, New Ahinsapur, Fatehpura
Udaipur - 313004
Mobile: +91 9983991888
E-mail: anurag.shah@siemens.com

Ujjain

Tirupati Heights, B-Block, Flat No. 206
Nana Kheda, Ujjain-Indore Road
Ujjain - 456010 (MP)
Mobile: +91 8889911401
E-mail: bhadravisha.amit@siemens.com

Vapi

Flat No. 201, Gayatri Building
Near Jalaram Temple, NH 8
Vapi, District Valsad - 396195
Mobile: +91 9687668690
E-mail: pandey.abhishek@siemens.com

Vapi

Flat No. 302, 3rd Floor, Samrajya-IV
Royal Residency, Goluk Vihar Township
Charwada Road, Taluka- Pardi, Dist. Valsad
Vapi - 396195
Mobile: +91 9825147957
E-mail: rohit.darji@siemens.com

Vijayawada

Laxmi Nivas, 1st Floor, Flat No. FF2
443 8,442, Plot No. 08
Sundarayya Nagar, Payakapuram
Vijayawada - 520015, Andhra Pradesh
Mobile: +91 9642351144
E-mail: venkateswar.d@siemens.com

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Email: ics.india@siemens.com