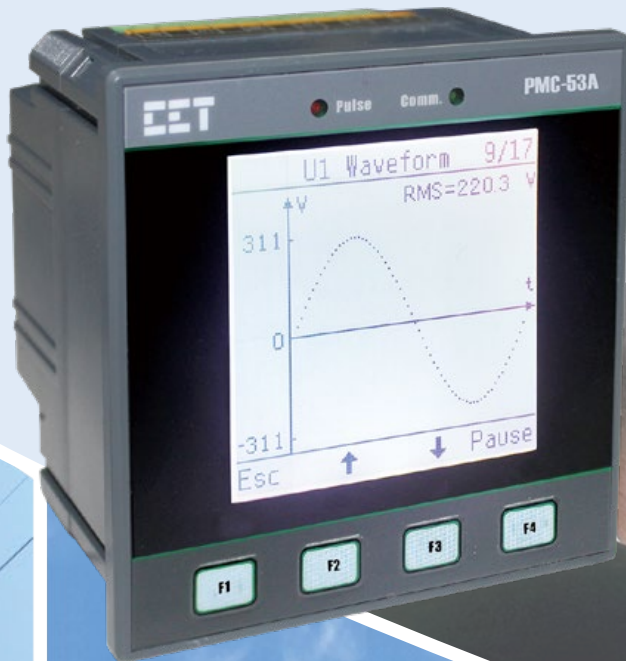




PMC-53A

Intelligent Multifunction Meter



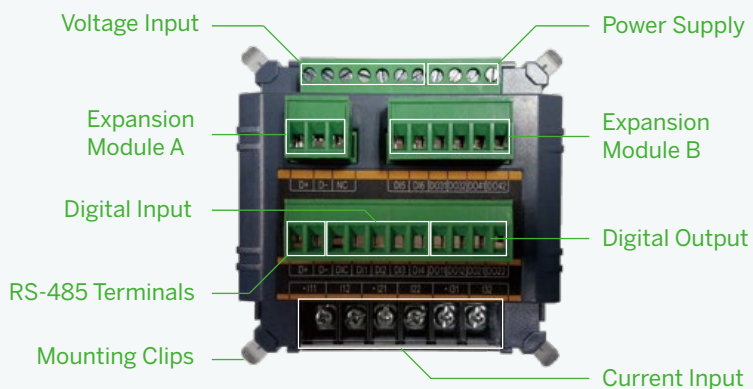
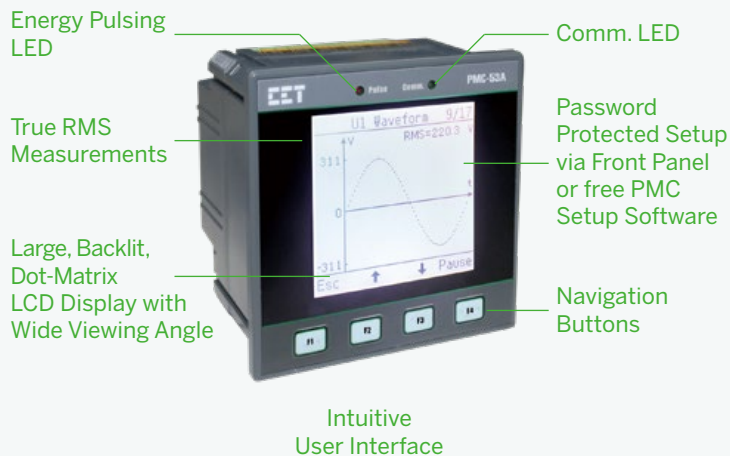
High Performance

PMC-53A Intelligent Multifunction Meter is CET's latest offer for the low-cost digital power/energy metering market. Housed in a standard DIN form factor measuring 96x96x88mm, it is perfectly suited for industrial, commercial and utility applications. The PMC-53A features quality construction, multifunction measurements and a large, backlit, Dot-Matrix LCD that is easy to navigate and user friendly. Compliance with the IEC62053-22 Class 0.5S, ANSI C12.20 Class 0.2 and EN50470-1/3 Class C Standards, it is a cost-effective replacement for analog instrumentation and is capable of displaying 4 measurements at once. It optionally provides I4 input for Neutral Current measurement, a second RS-485 port, up to six Digital Inputs for status monitoring, four Relay Outputs for control and alarm applications as well as other I/O options for different applications.

Typical Applications

- Industrial, Commercial and Utility Substation Metering
- Building, Factory and Process Automation
- Sub-metering and Cost Allocation
- Energy Management and Power Quality Monitoring

At-A-Glance



Features Summary

Basic Measurements

- ULN, ULL per Phase and Average
- Current per Phase and Average with calculated Neutral
- P, Q, S, PF per Phase and Total
- kWh, kvarh Import/Export/Net/Total and kVAh Total
- Frequency
- Device Operating Time (Running Hours)
- Optional I4 measurements
- Calculated Residual Current Ir (with optional I4 Input)

Advanced Measurements

- 1-cycle Real-time U & I Waveform Display @ 1s update rate
- U and I THD, TOHD, TEHD and Individual Harmonics up to 31st
- Current TDD, TDD Odd, TDD Even, K-Factor and Crest Factor
- U and I Unbalance and Phase Angle
- Displacement PF
- Fundamental U, I and P per Phase
- Total Fundamental P & Total Harmonic P
- U and I Symmetrical Components
- kvarh Q1-Q4
- Interval Energy for kWh/kvarh Imp/Exp and kVAh
- Present, Predicted and Max. Demands for P/Q/S Total and per phase Current with Timestamp for This Month & Last Month (or Since Last Reset & Before Last Reset)
- Two TOU schedules, each providing
 - 12 Seasons
 - 20 Daily Profiles, each with 12 Periods in 15-minute interval
 - 90 Holidays or Alternate Days
 - 8 Tariffs, each providing the following information
 - Total and 3-phase kWh/kvarh Import/Export, kVAh
 - P/Q/S Max. Demands
- 12 monthly recording of kWh/kvarh Import/Export/Total/Net, kVAh, kvarh Q1-Q4 as well as kWh/kvarh Import/Export and kVAh per Tariff

Ease of use

- Large, backlit, Dot-Matrix LCD display with wide viewing angle
- Intuitive user interface
- LED indicators for Energy Pulsing and Communication activities
- Password protected setup via Front Panel or free PMC Setup software
- Easy installation with mounting clips, no tools required

Setpoints

- 9 user programmable setpoints with extensive list of monitoring parameters including Voltage, Current, Power and THD, etc.
- Configurable thresholds, time delays and DO triggers

SOE Log

- 100 events time-stamped to ± 1 ms resolution
- Setup changes, Setpoint and DI status changes and DO operations

Max./Min. Log

- Max./Min. Log with Timestamp for Real-time measurements such as Voltage, Current, In, I4, Freq., P, Q, S, PF, Unbalance, K-Factor, Crest Factor and THD.
- Configurable for This Month & Last Month (or Since Last Reset & Before Last Reset)

Freeze Logs (Optional)

- 60 Daily Freeze Logs for kWh/kvarh/kVAh Total and P/Q/S Max. Demands
- 36 Monthly Freeze Logs for kWh/kvarh/kVAh Total and P/Q/S Max. Demands with Timestamp

PMC-53A

Data Recorder Log (Optional)

- 5 Data Recorders of 16 parameters each for Real-time measurements, Harmonics, Energy, Demand, TOU, Pulse Counters, etc.
- Recording interval from 1 minute to 40 days
- Configurable capacity up to a max. of 100 days at 15-minute interval

Diagnostics

- Frequency Out-of-Range, Loss of Voltage/Current
- P Direction per Phase and Total, Incorrect CT Polarity
- Incorrect U & I Phase Sequence

Communications

- Optically isolated RS-485 port at max. 38,400 bps
- Selectable Modbus RTU, BACnet MS/TP, Metasys N2 and DNP 3.0
- Optional 2nd RS-485 port with Modbus RTU support only

Real-Time Clock

- Battery-backed Real-time Clock with 25ppm accuracy (<2s per day)

System Integration

- Supported by CET's PecStar® iEMS and iEEM
- Easy integration into Johnson Controls Metasys with N2 or other Building Automation Systems with BACnet MS/TP or Modbus RTU
- DNP 3.0 for Utility Substation Automation

Inputs and Outputs

Digital Inputs (Optional)

- Up to 6 channels, volt free dry contact, 24VDC internally wetted
- 1000Hz sampling for status monitoring with programmable debounce
- Pulse counting with programmable weight for each channel for collecting WAGES (Water, Air, Gas, Electricity, Steam) information
- Tariff switching based on DI status

Digital Outputs (Optional)

- Up to 4 Form A mechanical relays for alarming and general purpose control

Pulse Outputs (Optional)

- Up to 4 Form A Solid State Relays for kWh and kvarh pulsing

Expansion Modules

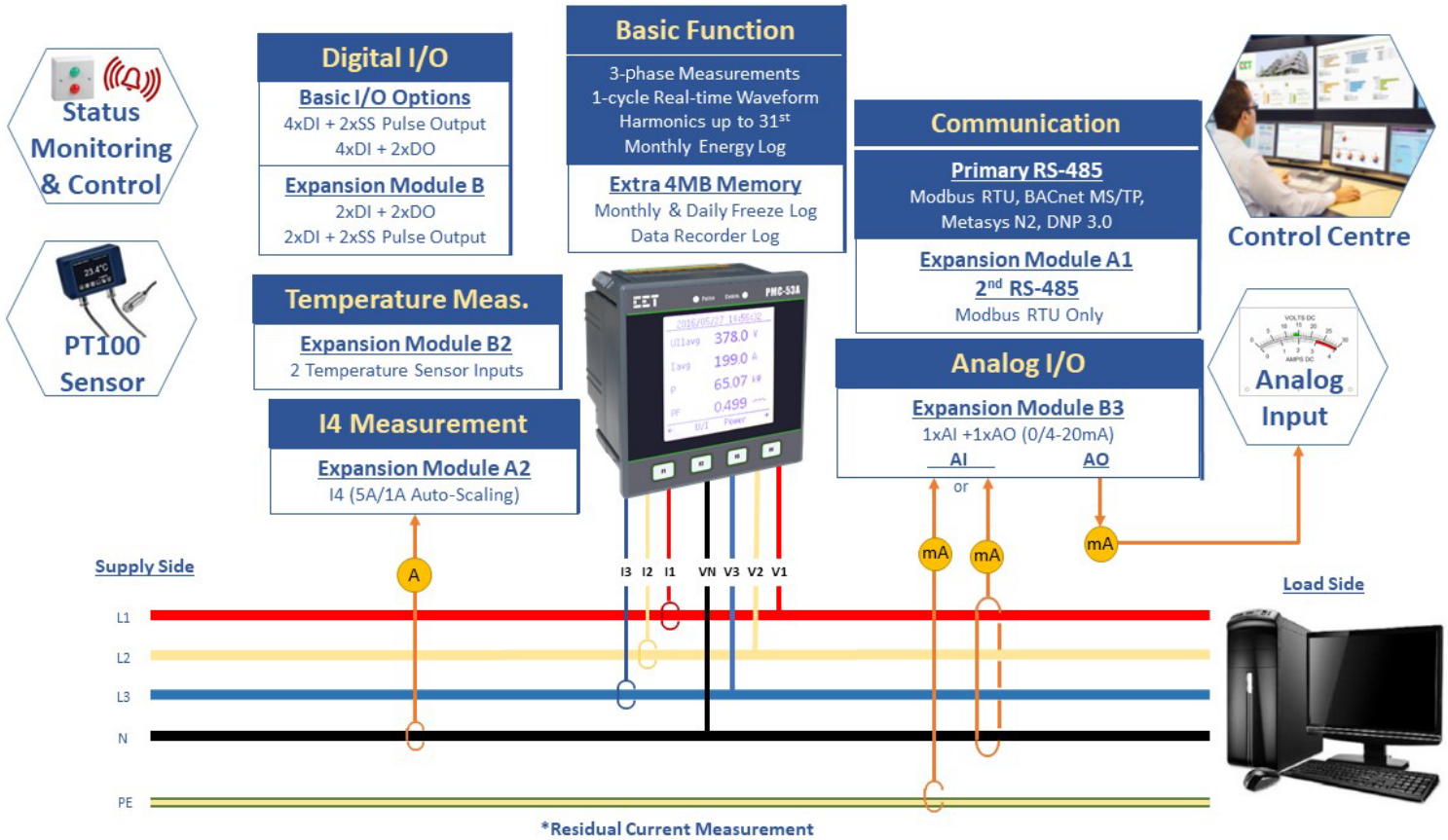
Expansion Module A Options

- 14 Input
- RS-485 port with optical isolation, supporting Modbus RTU

Expansion Module B Options

- 2xDigital Inputs and 2xRelay Outputs
- 2xDigital Inputs and 2xSolid State Pulse Outputs
- 2xRTD Inputs (PT100 sensors not included)
- 1xAI and 1xAO (0/4-20mA)

Typical Application



*Residual Current Measurement

Multiple Protocols

Accuracy

Parameters	Accuracy	Resolution
Voltage	± 0.2%	0.001V
Current	± 0.2%	0.001A
I4 (Measurement)	± 0.2%	0.001A
P, Q, S	± 0.5%	0.001kX
kWh, kVAh	IEC62053-22 Class 0.5S ANSI C12.20 Class 0.2 EN50470-1/3: 2006 Class C	0.1kXh
kvarh	IEC62053-24 Class 0.5S IEC62053-23 Class 2	0.1kvarh
PF	± 0.5%	0.001
Frequency	± 0.02Hz	0.01Hz
THD	IEC61000-4-7 Class B	0.001%
K-Factor	IEC61000-4-7 Class B	0.001
Phase Angle	± 1°	0.1°

Digital Outputs (DO11, DO12, DO21, DO22)

Type	Form A Mechanical Relay
Loading	5A @ 250VAC or 30VDC
Load Type	Resistive

Pulse Outputs (E1+, E1-, E2+, E2-)

Type	Form A Solid State Relay
Isolation	Optical
Load Type	Resistive
Output	Optocoupler output as ON-OFF
Max. Load Voltage	50VDC
Max. Forward Current	50mA

Installation Torque

Current Inputs	12lb-in (1.3N.m)
Power Supply, Voltage Inputs, RS-485 and I/O	5lb-in (0.5N.m)

Technical Specifications

Voltage Inputs (V1, V2, V3, VN)

Standard Un	400ULN/690ULL
Range	10V to 1.2xUn
Overload	1.2xUn continuous, 2xUn for 1s
Burden	<0.02VA per phase
Measurement Category	CAT III up to 600ULL
Frequency	45-65Hz

Current Inputs (I11, I12, I21, I22, I31, I32)

Standard In	5A (Optional 1A)
Range	0.1% to 200% In
Starting Current	0.1% In
Overload	2xIn continuous, 20xIn for 1s
Measurement Category	CAT III up to 600ULL
Burden	<0.15VA per phase @ 5A

Optional I4 Input (I41, I42)

In	5A (5A/1A Auto-Scaling)
Range	0.1% to 200% In
Starting Current	0.1% In

Power Supply (L+, N-)

Standard	95-250VAC/DC, ± 10%, 47-440Hz
Optional	20-60VDC
Burden	<2W
Overvoltage Category	CAT III up to 300ULN

Digital Inputs (DI1, DI2, DI3, DI4, DIC)

Type	Dry contact, 24VDC internally wetted
Sampling	1000Hz
Hysteresis	1ms minimum

Environmental Conditions

Operating Temp.	-25°C to 70°C
Storage Temp.	-40°C to 85°C
Humidity	5% to 95% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa
Altitude	< 2000m
Location/Mounting	For indoor use only

Mechanical Characteristics

Panel Cutout	92x92mm (3.62"x3.62")
Unit Dimensions	96x96x88mm
IP Rating	IP65

Safety Standards

Safety Requirements

CE LVD 2014/35/EU	EN61010-1: 2010 EN61010-2-030: 2010
cULus Listed	UL 61010-1 Ed. 3 CAN/CSA C22.2 NO. 61010-1-12 Ed. 3 UL 61010-2-030 Ed. 2 CSA C22.2 NO. 61010-2-030: 18 Ed. 2 UL 61010-2-201 Ed. 2 CSA C22.2 NO. 61010-2-201 Ed. 2
MID per 2014/32/EU	EN50470-1: 2006 EN50470-3: 2006
Electrical Safety in Low Voltage Distribution Systems up to 1000Vac and 1500 Vdc	IEC61557-12: 2018 (PMD)
Insulation AC Voltage: 4kV @ 1 minute Insulation Resistance: >100MΩ Impulse Voltage: 6kV, 1.2/50μs	IEC62052-11: 2003 IEC62053-22: 2003 EN50470-1: 2006



Ordering Information

Product Code		Description							
PMC-53A Intelligent Multifunction Meter									
Basic Function#	1	Dot-Matrix LCD, 1xRS-485 with Multiple Protocol, Monthly Energy Log							
	2*	Model 1 + Monthly & Daily Freeze Log, Data Recording Log, 4MB Memory							
	3*	Model 1 + 4xDI + 2xSS Pulse Output							
	A*	Model 1 + 4xDI + 2xDO (Mechanical Relay)							
	B*	Model A + Monthly & Daily Freeze Log, Data Recording Log, 4MB Memory							
Input Current	5	5A/1A Auto-Scaling (Class 0.5S for 5A and Class 1 for 1A)							
	1	1A							
Input Voltage	9	400ULN/690ULL							
	2	95-250 VAC/DC, 47-440Hz							
Power Supply	3	20-60VDC							
	4	95-480 VAC/DC, 47-440Hz							
Frequency	5	45Hz-65Hz							
Language	E	English							
Expansion A*	A1	1xRS-485							
	A2	I4 (5A/1A Auto-Scaling)							
Expansion B*	B1	2xDI + 2xDO (Mechanical Relay)							
	B2	2xRTD (PT100 sensors not included)							
	B3	1xAI + 1xAO (0/4-20mA)							
	B4	2xDI + 2xSS Pulse Output							
PMC-53A	1	5	9	2	5	E	-	-	PMC-53A-15925E (Standard Model)

* Additional charges apply

Models PMC-53A-X5925E (X=1, 2, 3, A, B) are certified for MID Class C

1) Model No. with only one Expansion can be written as PMC-53A-15925E-Ax or PMC-53A-15925E-Bx

2) Model No. with both Expansions can be written as PMC-53A-15925E-Ax-Bx

3) Options B1 and B4 for Expansion B are invalid with options 1, and 2 under Basic Function

Electromagnetic Compatibility

CE EMC Directive 2014/30/EU (EN61326: 2013)

Immunity Tests	
Electrostatic Discharge	EN61000-4-2: 2009
Radiated Fields	EN61000-4-3: 2006+A1: 2008+A2: 2010
Fast Transients	EN61000-4-4: 2012
Surges	EN 61000-4-5: 2014+A1: 2017
Conducted Disturbances	EN61000-4-6: 2014
Magnetic Fields	EN61000-4-8: 2010
Voltage Dips and Interruptions	EN61000-4-11: 2004+A1: 2017
Ring Wave	EN61000-4-12: 2017

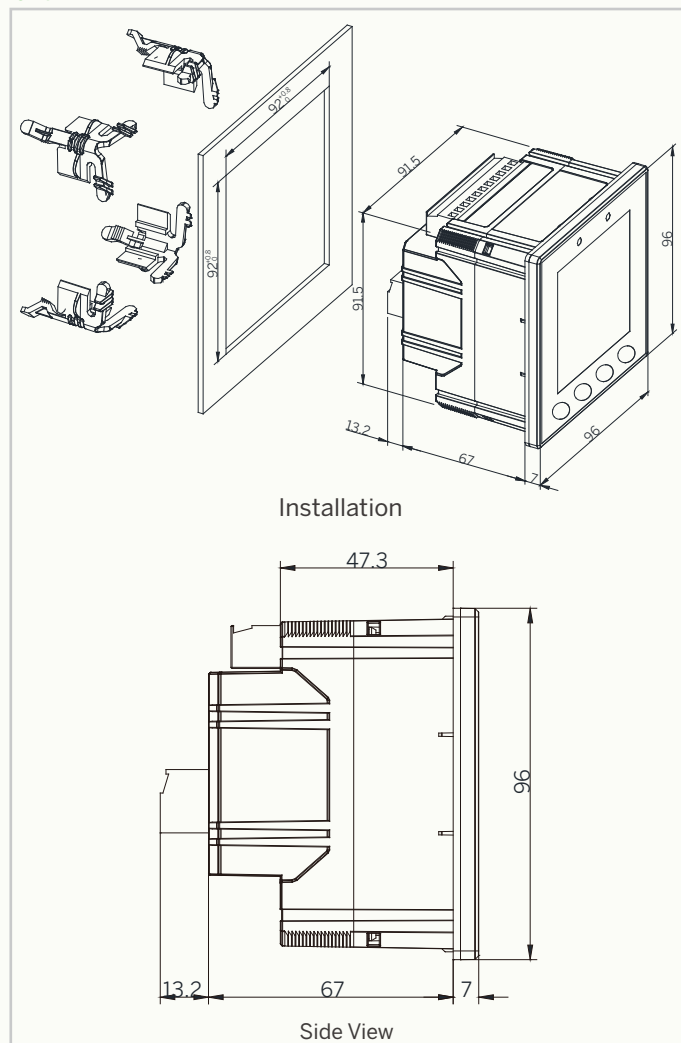
Emission Tests	
Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	EN55011: 2016
Electromagnetic Compatibility of Multimedia Equipment-Emission Requirements	EN55032: 2015
Limits for Harmonic Current Emissions for Equipment with Rated Current ≤ 16 A	EN61000-3-2: 2014
Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems for Equipment with Rated Current ≤ 16 A	EN61000-3-3: 2013
Emission Standard for Industrial Environments	EN61000-6-4: 2007+A1: 2011
Radiated Emissions	FCC 47CFR 15.109 Class B
Conducted Emissions	FCC 47CFR 15.107 Class B

Mechanical Tests	
Spring Hammer Test	IEC62052-11: 2003
Vibration Test	IEC62052-11: 2003
Shock Test	IEC62052-11: 2003

Revenue Metering Type Test Approval	
MID per EU Directive 2014/32/EU	Certificate No.: 0120/SGS0427
NMIM of Malaysia per OIML R46	Approval No.: ATS-0026-20

Device View and Dimensions

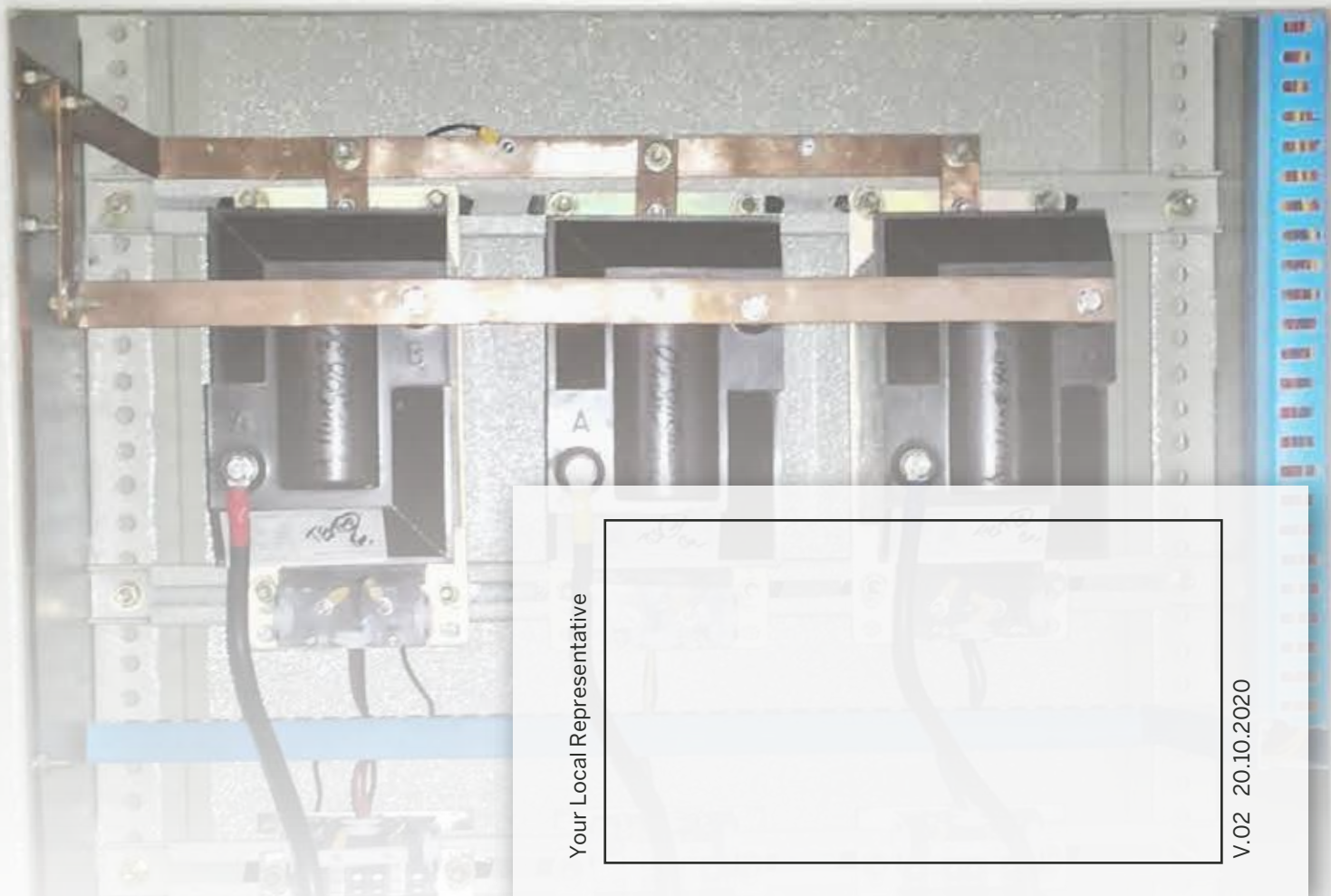
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Your Local Representative

V.02 20.10.2020