OP2046-V02

# selec

**MFM376 SERIES**

Operating Instructions

**96 x 96**

## SPECIFICATIONS

**DISPLAY**
3 Row of 4 Digits
7 Segment LED Display 0.49 inch Height Digit
Integrated with parameter Units

**WIRING INPUT**
3 Ø - 4 wire, 3 Ø - 3 wire, 2 Ø - 3 wire and
1 Ø - 2 wire (R/Y/B Programmable)

**AUXILIARY SUPPLY**
40V-300V AC/DC

**RATED INPUT VOLTAGE**
11 to 300V AC (L-N) ; 19 to 519V AC (L-L)
Installation Category III (600V)

**FREQUENCY RANGE**
50-60 Hz

**RATED INPUT CURRENT**
Nominal 5A AC (Min-20mA, Max-6A)

**BURDEN**
0.5VA @ 5A per phase

**CT PRIMARY**
1A / 5A to 10,000A (Programmable for any value)
**Note :** 1A to 10,000A if CT secondary is 1 else 5A to 10,000A

**CT SECONDARY**
1A or 5A (programmable)

**PT PRIMARY**
100V to 500kV (Programmable for any value)

**PT SECONDARY**
100 to 500V (Programmable for any value)

**DISPLAY UPDATE TIME**
1 sec. for all parameters

**DISPLAY SCROLLING**
Auto / Manual / Default

**POWER CONSUMPTION**
Less than 5VA

**ENVIRONMENTAL CONDITIONS**
- Indoor use
- Altitude of up to 2000 meters
- Pollution degree II

Temperature : Operating : -10°C to 55°C
Storage : -20°C to 75°C
Humidity : Up to 85% non-condensing

**MOUNTING :** Panel mounting

**WEIGHT :** MFM376-C-CE : 200gms
MFM376-CE : 200gms

**OUTPUT**
**Pulse Output :** Voltage range : External 24V DC max.
Current capacity : 100 mA max
**Pulse Width :** 100ms ± 5ms.

## ORDER CODE INFORMATION

| Product | Supply | Certification | |
|---|---|---|---|
| | | CE | cULus LISTED |
| MFM376-C-CE | 40V-300V AC/DC,50/60Hz | ■ | — |
| MFM376-CE | 40V-300V AC/DC,50/60Hz | ■ | — |
| Installation Category III | | | |

## SERIAL COMMUNICATION

| | |
|---|---|
| **Interface standard and protocol** | RS485 and MODBUS RTU |
| **Communication address** | 1 to 255 |
| **Transmission mode** | Half duplex |
| **Data types** | Float and Integer |
| **Transmission distance** | 500m maximum |
| **Transmission Speed** | 300, 600,1200, 2400, 4800, 9600,19200 (in bps) |
| **Parity** | None, Odd, Even |
| **Stop bits** | 1 or 2 |

## ACCURACY

| Measurement | Accuracy |
|---|---|
| Voltage $V_{L-N}$ | ±0.5% of Full scale |
| Voltage $V_{L-L}$ | ±0.5% of Full scale |
| Current | ±0.5% of Full scale |
| Frequency | ±0.1%<br>For L-N Voltage >20V,<br>For L-L Voltage >35V |
| Active Power | 1% |
| Apparent power | 1% |
| Reactive Power | 1% |
| Power Factor | ±0.01 |
| Active Energy | Class 1 |
| Reactive Energy | Class 2 |
| Apparent Energy | Class 1 |

## RESOLUTION :

| PT Ratio x CT Ratio | kWh / kVAh / kVArh | Pulse | INT |
|---|---|---|---|
| ≤40 | 0.01K | 0.01K | 0.001K |
| ≤400 | 0.1K | 0.1K | 0.01K |
| ≤4000 | 1K | 1K | 0.1K |
| ≤40000 | 0.01M | 0.1M | 0.01M |
| ≤400000 | 0.1M | 0.1M | 0.01M |
| ≥4000000 | 1M | 0.1M | 0.01M |

**Note :** a) For voltage, current and power resolution is automatically adjusted
b) For power factor resolution is 0.001
c) INT LED blinks indicating accumulation of energy, if load is connected on any one phase of 3 Phase.

## SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

- Do not use the equipment if there is any mechanical damage.
- Ensure that the equipment is supplied with correct voltage.

**⚠ CAUTION :**

1. Read complete instructions prior to installation and operation of the unit.
2. Risk of electric shock.
3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.

## WIRING GUIDELINES

**⚠ WARNING :**

1. To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement.
2. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.
3. Use lugged terminals.
4. To reduce electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made with shortest connections.
5. Layout of connecting cables shall be away from any internal EMI source.
6. Cable used for connection to power source, must have a cross section of 0.5mm$^2$ to 2.5mm$^2$ (20 to 14AWG ; 75°C(min)). These wires shall have current carrying capacity of 6A.
7. Copper cable should be used (Stranded or Single core cable).
8. Before attempting work on device, ensure absence of voltages using appropriate voltage detection device.

## INSTALLATION GUIDELINES

**⚠ CAUTION :**

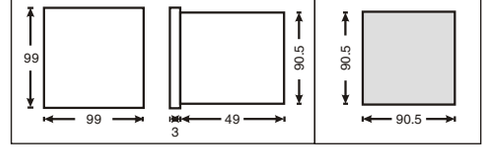
1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
4. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.
5. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
6. The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275V AC / 0.5Amp for electrical circuitry / battery is highly recommended.

## MECHANICAL INSTALLATION

For installing the meter

1. Prepare the panel cutout with proper dimensions as shown below.
2. Push the meter into the panel cutout. Secure the meter in its place by fitting the clamp on the rear side. fit clamps on both sides in diagonally opposite location for optimum fitting.
3. For proper sealing, tighten the screws evenly with required torque.

| Outline Dimensions (in mm) | Panel cutout Dimensions (in mm) |
|---|---|

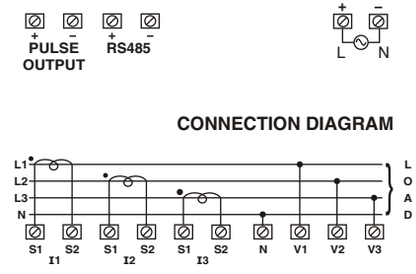



**MAINTENANCE**

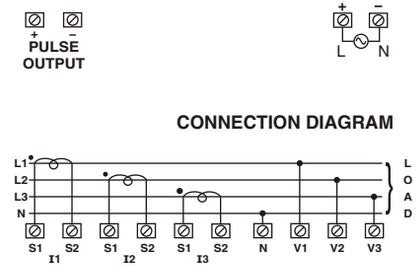
1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean dry or damp cloth. Do not use any cleaning agent other than water.

## TERMINAL CONNECTIONS

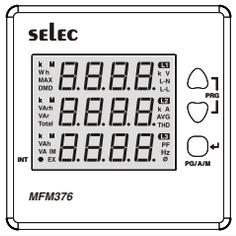
**MFM376-C-CE**




**MFM376-CE**



## FRONT PANEL DESCRIPTION




## ONLINE PAGE DESCRIPTION

There are three dedicated keys labelled as △,▽and ▢. Use these 3 keys to read parameters. Simply press these keys to read the parameters. Units of corresponding parameters on display will glow automatically.
Use ▽ key to go back to previous page in sub page.

**MFM376-C-CE / MFM376-CE**

| KEY PRESS | ONLINE PAGE DESCRIPTION | |
|---|---|---|
| — | 1st screen | Displays three phase line to neutral voltage. |
| Press "△" | 2nd screen | Displays three phase line to line voltage. |
| | 3rd screen | Displays total percentage harmonics of line to neutral voltage of three phase. |
| | 4th screen | Displays total percentage harmonics of line to line voltage of three phase. |
| | 5th screen | Displays three phase instantaneous line to neutral voltage. |
| | 6th screen | Displays three phase instantaneous line to line voltage. |
| **Note :** 1) For 3 phase 3 wire, only second, forth and sixth screen will be available. 2) For 1 phase 2 Wire, only first, third and fifth screen of selected phase will be available. | | |
| Press "▢" | 1st screen | Displays three phase current. |
| Press "△" | 2nd screen | Displays total percentage harmonics of current of three phase |
| | 3rd screen | Displays active, reactive and apparent power of first phase. |
| | 4th screen | Displays active, reactive and apparent power of second phase. |
| | 5th screen | Displays active, reactive and apparent power of third phase. |
| | 6th screen | Displays total active, reactive and apparent power of three phase. |
| | 7th screen | Displays active, reactive and apparent maximum power demand of three phase. |
| | 8th screen | Displays active and reactive minimum power demand of three phase. |
| **Note :** 1) For 3 phase 3 wire, only first, second, sixth, seventh and eighth screen will be available. 2) For 1 phase 2 Wire, only first, second, third, seventh and eighth screen of selected phase will be available. | | |
| Press "▢" | 1st screen | Displays three phase instantaneous current. |
| | 2nd screen | Displays three phase power factor. |
| Press "▢" | 3rd screen | Displays three phase phase angle. |
| Press "△" | 4th screen | Displays three phase average line to neutral voltage, current and power factor. |
| | 5th screen | Displays three phase average line to line voltage, current and frequency. |
| **Note :** 1) For 3 phase 3 wire, only first screen, average power factor, fifth screen will be available. 2) For 1 phase 2 Wire, only first, second, third & forth screen of selected phase will be available. | | |
| Press "▢" | 1st screen | Displays three phase maximum demand of current. |
| Press "△" | 2nd screen | Displays import active energy. |
| | 3rd screen | Displays export active energy. |
| | 4th screen | Displays total active energy. |
| | 5th screen | Displays import reactive energy. |
| | 6th screen | Displays export reactive energy. |
| | 7th screen | Displays total reactive energy. |
| | 8th screen | Displays total apparent energy. |
| | 9th screen | Displays Run Hour. |
| | 10th screen | Displays Auxiliary interrupts. |
| **Note :** 1) For 3 phase 3 wire, all screens will be available. 2) For 1 phase 2 wire, all screens of selected phase will be available. | | |

## SERIAL NUMBER DESCRIPTION

Press ▽ and ▢ key for 10sec to display serial no for 5sec.

## AUTOMATIC / MANUAL / DEFAULT MODE

Press ▢ key for 3sec to toggle between **AUTOMATIC / MANUAL / DEFAULT MODE.**
In **AUTOMATIC MODE,** only first screen of all pages will be scrolled.
In **MANUAL MODE,** the page will be change only after any key is pressed.
In **DEFAULT MODE,**Total kWh page will be displayed if any key is not pressed for 36 seconds.

## PHASE DETECTION

Press △ key for 3sec displays voltage sequence detection on last row for 3P4W and 3P3W only.

## CT ERROR

Press ▽ key for 3sec displays current polarity detection on last row. (Not applicable for 3 phase 3 wire)

## RUN HOUR SELECTION

For Zero Run Hour Selection : Run Hour is ON Hour
For Non zero Run Hour Selection: Parameter selectable between 1% to 10% will act as ON Hour.

## CONFIGURATION

There are three dedicated keys with symbol △, ▽ & ▢. Use these 3 keys to enter into configuration menu
**Note :** Setting should be done by professional after going through this user manual and having understood the application situation.

For the configuration setting mode :

- Use △ + ▽ key for 3 sec to enter and exit from configuration menu.
- Use ▽ key to shift parameter value in edit mode .
- Use △ key to increment the parameter and for roll over. (Only if parameter is in edit mode)
- Use ▢ key to save the parameter value & go to next page.
- Press ▽ key and use ▢ key to go back to previous page.

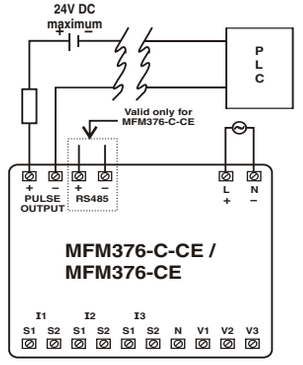
To set value of PT and CT Primary in "K", first set the value in division of 100 which one want to set. (i.e. If want to set 500k then set 5000) then press ▽ key for 3 sec. It will shift the value in K with 0.1 resolution i.e. 500.0 with "K" symbol.

| Config page. | Function | Range or Selection | Factory Setting |
|---|---|---|---|
| | Password | 0000 to 9998 | 1000 |
| 1 | Change Password | No / Yes | No |
| 1.1 | New Password | 0000 to 9998 | 1000 |
| 2 | Network Selection | 3P4W / 3P3W / 1P2W-R/1P2W-Y / 1P2W-B | 3P4W |
| 3 | CT Secondary | 5 / 1 | 5 |
| 4 | CT Primary | 5 to 10,000 | 5 |
| 5 | PT Secondary | 100 to 500 | 350 |
| 6 | PT primary | 100 to 500k | 350 |
| 7 | Demand Interval Method | Sliding/Fixed | Sliding |
| 8 | Demand Interval Duration | 1 to 30 | 15 |
| 9 | Demand interval length | 1 to 30 | 1 |
| 10 | Pulse Weight | 0.01 to 99.99 | 0.01 |
| 11 | Pulse Duration | 0.1 to 2.0 | 0.1 |
| 12 | Run Hour Selection | 0 to 10 | 0 |
| *13 | Slave Id | 1 to 255 | 1 |
| *14 | Baud Rate | 300, 600, 1200, 2400, 4800, 9600 and 19200 (bps) | 9600 |
| *15 | Parity | None, Odd, Even | None |
| *16 | Stop Bit | 1 or 2 | 1 |
| *17 | Endianness | MSB or LSB | MSB |
| 18 | Factory Default | Yes / No | No |
| 19 | Reset Energy and Max Dmd | Yes / No | No |
| 19.1 | Password | 0001 to 9999 | 1001 |
| 19.01 | Reset kWh | Yes / No | No |
| 19.02 | Rest kVArh | Yes / No | No |
| 19.03 | Reset kVah | Yes / No | No |
| 19.04 | Reset MAx | Yes / No | No |
| 19.05 | Reset Run Hour | Yes / No | No |
| 19.06 | Reset Interrupt | Yes / No | No |

• For resetting energy parameter user will be promoted for password. If correct password is entered. User will be able to reset all energy parameters. This password will be value which will be greater than the configuration password by 1.
* Marked values are only valid for MFM376-C-CE.

## APPLICATION OF PULSE OUTPUT

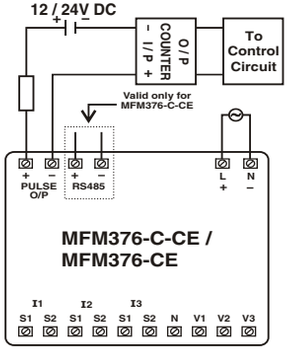
### ● PROCESS INTEGRATION




Pulse output from MFM376-C-CE / MFM376-CE meter can be interfaced into a process through a PLC for on line control of energy content in the process.
If the PLC has a self excited digital input, external DC supply is not needed.

The kWh pulse is also used to derive average kWh information at the PLC.

### ● ENERGY CONTROLLER




Pulse output from MFM376-C-CE / MFM376-CE meter can be used as alarm generator or total energy controller by interfacing it with Pre-settable counter and control circuits (Contactors, Relay, Trip Circuit).

The counter is loaded with the maximum energy consumption. When count reaches setpoint it provides output to control circuit to take appropriate action.

## NETWORK SELECTION AND WIRING INPUT

| Network selection in configuration mode | Wiring |
|---|---|
| 3P4W | 3P4W, 2P3W |
| 3P3W | 3P3W |
| 1P2W | 1P2W-R, 1P2W-Y, 1P2W-B |

## MODBUS REGISTER ADDRESSES LIST

**Readable parameters for Communication valid only for MFM376-C-CE : [ Length (Register) : 2 ; Data Structure : Float ]**

| Address | Hex Address | Parameter |
|---|---|---|
| 30000 | 0x00 | Voltage V1N |
| 30002 | 0x02 | Voltage V2N |
| 30004 | 0x04 | Voltage V3N |
| 30006 | 0x06 | Average Voltage LN |
| 30008 | 0x08 | Voltage V12 |
| 30010 | 0x0A | Voltage V23 |
| 30012 | 0x0C | Voltage V31 |
| 30014 | 0x0E | Average Voltage LL |
| 30016 | 0x10 | Current I1 |
| 30018 | 0x12 | Current I2 |
| 30020 | 0x14 | Current I3 |
| 30022 | 0x16 | Average Current |
| 30024 | 0x18 | kW1 |
| 30026 | 0x1A | kW2 |
| 30028 | 0x1C | kW3 |
| 30030 | 0x1E | kVAr1 |
| 30032 | 0x20 | kVAr2 |
| 30034 | 0x22 | kVAr3 |
| 30036 | 0x24 | kVA1 |
| 30038 | 0x26 | kVA2 |
| 30040 | 0x28 | kVA3 |
| 30042 | 0x2A | PF 1 |
| 30044 | 0x2C | PF 2 |
| 30046 | 0x2E | PF 3 |
| 30048 | 0x30 | Average PF |
| 30050 | 0x32 | Frequency |
| 30052 | 0x34 | Total KW |
| 30054 | 0x36 | Total KVAR |
| 30056 | 0x38 | Total KVA |
| 30058 | 0x3A | Active Power Max Demand |
| 30060 | 0x3C | Active Power Min Demand |
| 30062 | 0x3E | Reactive Power Max Demand |
| 30064 | 0x40 | Reactive Power Min Demand |
| 30066 | 0x42 | Apparent Power Max Demand |
| 30068 | 0x44 | MAX Instantaneous voltage V1N |
| 30070 | 0x46 | MAX Instantaneous voltage V2N |
| 30072 | 0x48 | MAX Instantaneous voltage V3N |
| 30074 | 0x4A | MAX Instantaneous voltage V12 |
| 30076 | 0x4C | MAX Instantaneous voltage V23 |
| 30078 | 0x4E | MAX Instantaneous voltage V31 |
| 30080 | 0x50 | MAX Instantaneous current I1 |
| 30082 | 0x52 | MAX Instantaneous current I2 |
| 30084 | 0x54 | MAX Instantaneous current I3 |
| 30086 | 0x56 | Import Active energy |
| 30088 | 0x58 | Export Active energy |
| 30090 | 0x5A | Total Active energy |
| 30092 | 0x5C | Import Reactive energy |
| 30094 | 0x5E | Export Reactive energy |
| 30096 | 0x60 | Total Reactive energy |
| 30098 | 0x62 | Total Apparent energy |
| 30100 | 0x64 | Run Hour |
| 30102 | 0x66 | Auxillary Interrupts |
| | | Total Harmonic Distortion(THD) |
| 30124 | 0x7C | THD of Voltage V1N |
| 30126 | 0x7E | THD of Voltage V2N |
| 30128 | 0x80 | THD of Voltage V3N |
| 30130 | 0x82 | THD of Voltage V12 |
| 30132 | 0x84 | THD of Voltage V23 |
| 30134 | 0x86 | THD of Voltage V31 |
| 30136 | 0x88 | THD of Current I1 |
| 30138 | 0x8A | THD of Current I2 |
| 30140 | 0x8C | THD of Current I3 |
| 30684 | 0x2AC | Serial number of unit |

**Formula to find address of individual Harmonic**

| Constant Parameter | Meaning | Constant Parameter | Meaning |
|---|---|---|---|
| 0 | Voltage V1N | 5 | Voltage V31 |
| 1 | Voltage V2N | 6 | Current I1 |
| 2 | Voltage V3N | 7 | Current I2 |
| 3 | Voltage V12 | 8 | Current I3 |
| 4 | Voltage V23 | | |

{143 + [(Harmonic no-2) x 2] + 60 x Constant Parameter }
For Example,
To find the 14th Harmonic address of Voltage V31.
Following formula can be used :
Formula with the parameter :
{143 + [(Harmonic no-2) x 2] + 60 x C P}
Eg. {143 + [(14-2) x 2 ] + 60 x 5} = 467
So, Check the 14th Harmonic of Voltage V31 at 467 address.

**Readable / writable parameters for Communication valid only for MFM376-C-CE :**
**Readable / writable parameters : [Data Structure: Integer]**

| Address | Hex Address | Parameter | Range | | Length (Register) |
|---|---|---|---|---|---|
| 40000 | 0x00 | Password | Min value : 0 | Max value : 9998 | 1 |
| 40001 | 0x01 | N/W selection | Value : 0 | Meaning : 3P-4W | 1 |
| | | | Value : 1 | Meaning : 3P-3W | 1 |
| | | | Value : 2 | Meaning : 1P2W-P1 | 1 |
| | | | Value : 3 | Meaning : 1P2W-P2 | 1 |
| | | | Value : 4 | Meaning : 1P2W-P3 | 1 |
| 40002 | 0x02 | CT Secondary (A) | Min Value : 1 | Max Value : 5 | 1 |
| 40003 | 0x03 | CT primary (CT Secondary = 5) (A) | Min Value : 5 | Max Value : 10000 | 1 |
| | | CT primary (CT Secondary = 1) (A) | Min Value : 1 | Max Value : 10000 | |
| 40004 | 0x04 | PT Secondary (V) | Min Value : 100 | Max Value : 500 | 1 |
| 40005 | 0x05 | PT primary (V) | Min Value : 100 | Max Value : 500000 | 2 |
| 40007 | 0x07 | Demand Interval Method | Value : 0x0000 | Meaning : Sliding | 1 |
| | | | Value : 0x0001 | Meaning : Fixed | 1 |
| 40008 | 0x08 | Demand Interval Length(min) | Min Value : 1 | Max Value : 30 | 1 |
| 40009 | 0x09 | Demand Interval Duration | Min Value : 1 | Max Value : 30 | 1 |
| 40010 | 0x0A | Pulse Weight | Min Value : 0.01 | Max Value : 99.99 | 1 |
| 40011 | 0x0B | Pulse Duration | Min Value : 0.1 | Max Value : 2.0 | 1 |
| 40012 | 0x0C | Run Hour Selection | Min Value : 0 | Max Value : 10 | 1 |
| 40013 | 0x0D | Slave ID | Min Value : 1 | Max Value : 255 | 1 |
| | | | **Value** | **Meaning** | |
| 40014 | 0x0E | Baud rate | 0x0000 | 300 | 1 |
| | | | 0x0001 | 600 | |
| | | | 0x0002 | 1200 | |
| | | | 0x0003 | 2400 | |
| | | | 0x0004 | 4800 | |
| | | | 0x0005 | 9600 | |
| | | | 0x0006 | 19200 | |
| 40015 | 0x0F | Parity | 0x0000 | None | 1 |
| | | | 0x0001 | Odd | |
| | | | 0x0002 | Even | |
| 40016 | 0x10 | Stop bit | 0x0000 | 1 | 1 |
| | | | 0x0001 | 2 | |
| 40017 | 0x11 | Factory Default | 1 | Set to factory setting range | 1 |
| 40018 | 0x12 | Reset kWh | 1 | Reset Total Active Energy | 1 |
| 40019 | 0x13 | Reset kVAh | 1 | Reset Total Apparent Energy | 1 |
| 40020 | 0x14 | Reset kVArh | 1 | Reset Total Reactive Energy | 1 |
| 40021 | 0x15 | Reset MAX Demand | 1 | Reset Maximum Demand | 1 |
| 40022 | 0x16 | Reset Run Hour | 1 | Reset Run Hour | 1 |
| 40023 | 0x17 | Reset Interrupts Count | 1 | Reset Auxillary Interrupt Count | 1 |
| 40070 | 0x46 | Change Endianness | Value :0 or 1 | Meaning :<br>0: Mid Little Endian (CDAB)<br>1: Big Endian (ABCD)<br>Default setting :Big Endian | 1 |

## EXAMPLE TO READ DATA FROM INPUT REGISTER

### Data format: Big Endian (Default format)

If Total Active Energy = 1234.12kWh
Start Address : 30090, No. Of register : 02
Hexadecimal Equivalent of 1234.12 is 0x449A43D7

Data stored at 30090 is LSB : A 44 B 9A

Data Stored at 30091 is MSB : C 43 D D7

Data Format to be followed is A-B-C-D

### Data format: Mid Little Endian

If Total Active Energy = 1234.12kWh
Start Address : 30090, No. Of register : 02
Hexadecimal Equivalent of 1234.12 is 0x449A43D7

Data stored at 30090 is LSB : C 43 D D7

Data Stored at 30091 is MSB : A 44 B 9A

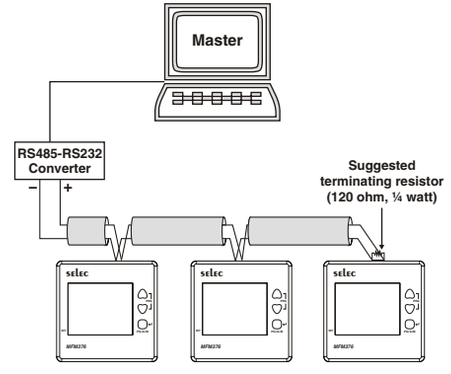
Data Format to be followed is C-D-A-B

## POWER FACTOR SIGN CONVENTION

Power Factor sign convention (PF sign) can be positive or negative, and is defined by the conventions used by the IEC standard.
PF sign correlates with the direction of real power (kW) flow.

- Quadrant 1 and 4: Positive real power (+kW). The PF sign is positive(+).
- Quadrant 2 and 3: Negative real power (-kW). The PF sign is negative(-).

## CONNECTION DIAGRAM FOR COMMUNICATION
**VALID ONLY FOR MFM376-C-CE**



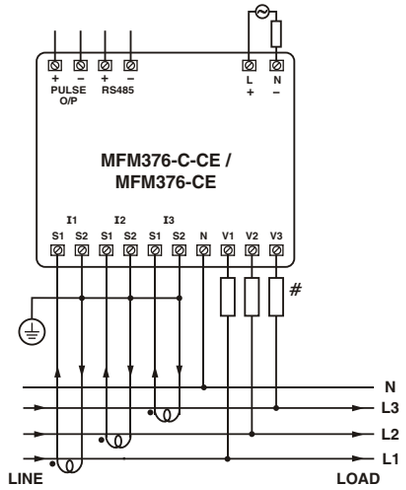

Contact sales for PC based monitoring software to communicate with the meters.

# All fuse types: 0.5A class CC UL type
0.5A fast acting 600V

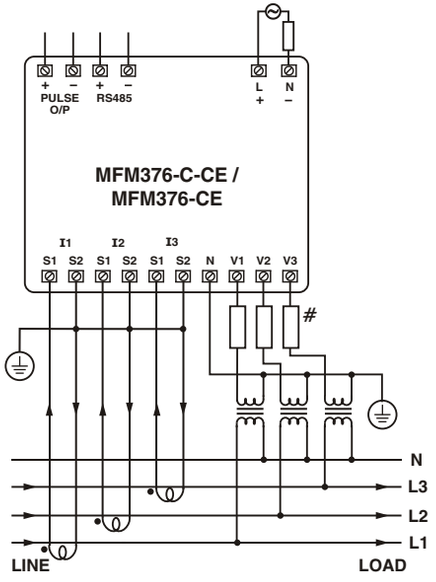
## TYPICAL WIRING DIAGRAM

### 3 PHASE 4-WIRE (COMMONLY USED)

**3 Ø - 4 WIRE, 3 CT'S**

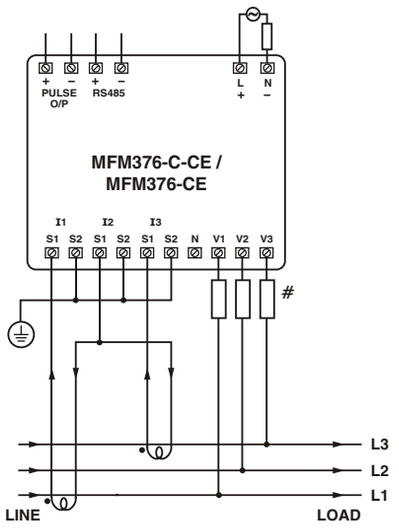



**3 Ø - 4 WIRE, 3 CT'S and 3 PT'S**

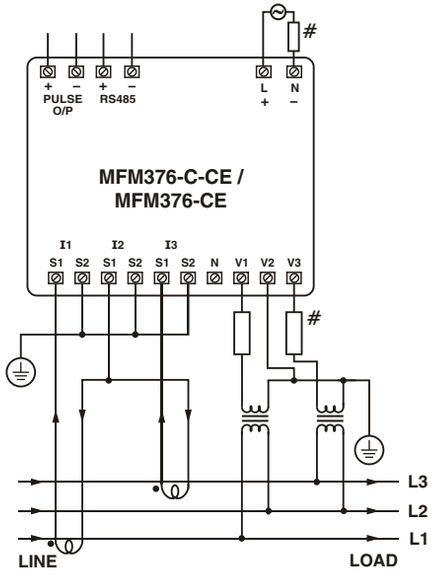



### 3 PHASE 3-WIRE

**3 Ø - 3 WIRE, 2 CT'S**

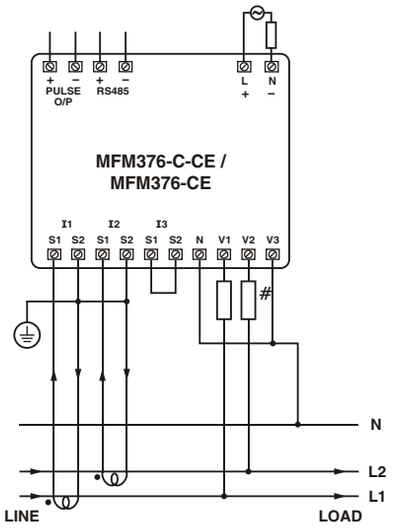



**3 Ø - 3 WIRE, 2 CT'S and 2 PT'S**

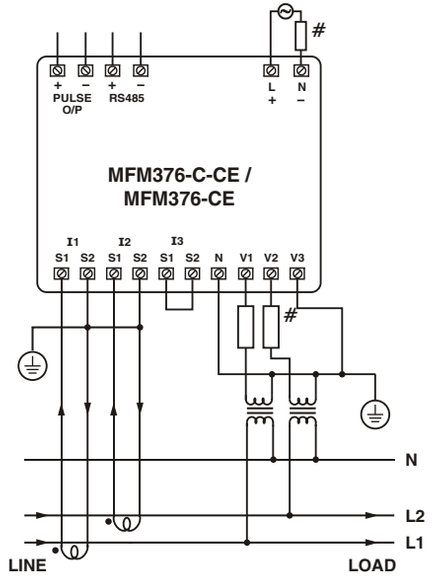



### 2 PHASE - 3 WIRE

**2 Ø - 3 WIRE, 2 CT'S**

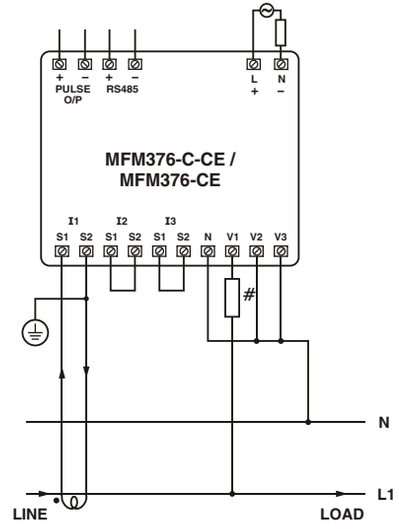



**2 Ø - 3 WIRE, 2 CT'S and 2 PT'S**




### 1 PHASE - 2 WIRE

**1 Ø - 2 WIRE, 1 CT**




(Specifications are subject to change, since development is a continuous process.)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