

MIERNIK PARAMETRÓW SIECI NA SZYNĘ  
RAIL MOUNTED POWER NETWORK METER

**NR30, NR30IoT**



INSTRUKCJA OBSŁUGI - SZYBKI START **PL**  
USER'S MANUAL - QUICK START **EN**

# 1. WYMAGANIA PODSTAWOWE, BEZPIECZEŃSTWO UŻYTKOWANIA

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W zakresie bezpieczeństwa użytkowania miernik odpowiada wymaganiom normy PN-EN 61010-1.

## **Uwagi dotyczące bezpieczeństwa:**

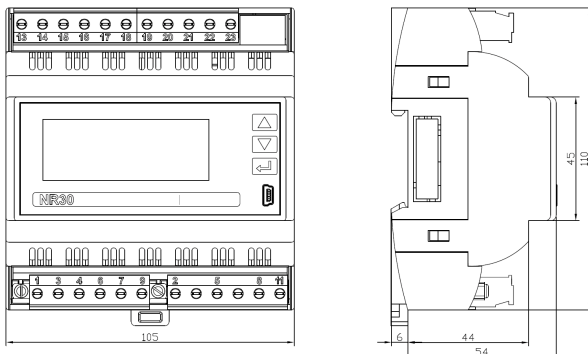
- Instalacji i podłączeń miernika powinien dokonywać wykwalifikowany personel. Należy wziąć pod uwagę wszystkie dostępne wymogi ochrony.
- Przed włączeniem miernika należy sprawdzić poprawność połączeń.
- Przed zdjęciem obudowy miernika należy wyłączyć jego zasilanie i odłączyć obwody pomiarowe.
- Zdjęcie obudowy miernika w trakcie trwania umowy gwarancyjnej powoduje jej unieważnienie.
- Miernik spełnia wymagania dotyczące kompatybilności elektromagnetycznej w środowisku przemysłowym.
- W instalacji budynku powinien być wyłącznik lub wyłącznik automatyczny, umieszczony w pobliżu urządzenia, łatwo dostępny dla operatora i odpowiednio oznakowany.

## 2. MONTAŻ

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Miernik jest przystosowany do montażu w modułowych rozdzielnicach instalacyjnych na wsporniku szynowym 35 mm.

Wymiary obudowy 105 x 110 x 60 mm. Na zewnątrz miernika znajdują się listwy zaciskowe, śrubowe które umożliwiają przyłączenie przewodów zewnętrznych o przekroju do 5,3 mm<sup>2</sup> / pomiary pośrednie/ i do 16 mm<sup>2</sup> /pomiary bezpośrednie/.



*Rys. 1. Rysunek gabarytowy miernika NR30, NR30IoT*

### 3. SCHEMATY PODŁĄCZEŃ

Patrz rysunki 2-6, str. 37

## 4. PROGRAMOWANIE NR30, NR30IoT

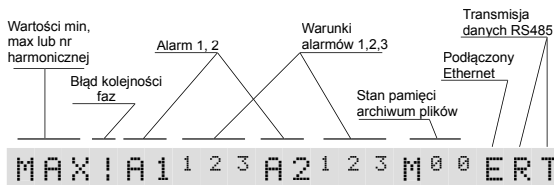
Miernik NR30 ma 3 przyciski i wyświetlacz LCD znakowy 20 x 4 wiersze.  
Opis panelu przedniego:

|                                                                                   |                                                      |         |                                                               |
|-----------------------------------------------------------------------------------|------------------------------------------------------|---------|---------------------------------------------------------------|
|  | przycisk zwiększania wartości i przesunięcia w prawo |         |                                                               |
|  | przycisk zmniejszania wartości i przesunięcia w lewo |         |                                                               |
|  | przycisk akceptacji                                  |         |                                                               |
|  | gniazdo USB                                          |         |                                                               |
| V,A,W,var,<br>VA, Wh,<br>varh,Hz,                                                 | jednostki wielkości wyświetlanych                    | k, M, G | kilo = $10^3$ , Mega = $10^6$ ,<br>Giga = $10^9$              |
| U1,I1,<br>P1, ...<br>..EnQ                                                        | oznaczenia wyświetlanych parametrów                  | L, C    | znaczniki charakteru obciążenia indukcyjnego, pojemnościowego |

Wartości mierzonych parametrów przedstawiane są na aktywnych stronach wybieranych kolejnym naciśnięciem przycisków  (strona następna)  lub (strona poprzednia).

Stronę stanowią 3 dowolne wielkości wybrane z tablicy 1 i wyświetlane jednocześnie na ekranie. Definiowanie stron opisano w trybie **Wyświetlanie**.

Górny wiersz wyświetlacza (pasek informacyjny) przeznaczony jest do wyświetlania informacji o stanie wyjść alarmowych, warunkach alarmów, stanie pamięci archiwum plików, stanie archiwizacji. Na pasku informacyjnym jest również symbol podłączenia Ethernetu, wskaźniki odbioru i nadawania danych na łączu RS485. W przypadku odwrotnej kolejności faz pulsuje symbol "!". Przy wyświetlaniu wartości minimalnych, maksymalnych lub harmonicznych pojawia się odpowiednia informacja.



Rys. 7. Pasek informacyjny

| Symbol                       | Informacja                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MIN<br>MAX                   | Naciskając przycisk  wyświetlimy kolejno wartość minimalną, maksymalną lub bieżącą (brak symbolu) wyświetlanej wielkości.                                                                                                                                                                                                                         |
| !                            | W przypadku podłączenia sygnałów napięciowych w odwrotnej kolejności pulsuje symbol informujący o błędzie kolejności faz.                                                                                                                                                                                                                                                                                                          |
| A1, A2                       | Stan wyjść alarmowych. W przypadku pojawienia się alarmu (alarmów) wyświetlane są odpowiednie symbole.                                                                                                                                                                                                                                                                                                                             |
| 1 2 3                        | Sygnalizacja spełnienia warunków alarmów                                                                                                                                                                                                                                                                                                                                                                                           |
| Stan pamięci archiwum plików |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| M <sup>00</sup>              | Procentowe zapelnienie pamięci archiwum plików np. M <sup>28</sup>                                                                                                                                                                                                                                                                                                                                                                 |
| M?                           | Brak pamięci archiwum lub niepoprawny system plików pamięci archiwum                                                                                                                                                                                                                                                                                                                                                               |
| F <sup>97</sup>              | Pulsuje co 1 sek. Zostało mniej niż 7% wolnego miejsca w pamięci archiwum plików. Czas do całkowitego zapelnienia archiwum plików około 14 dni przy 1 sek. interwale. Należy niezwłocznie usunąć zbędne pliki poprzez FTP. Przy zapelnieniu archiwum plików do wartości 95% uruchamiany jest tryb nadpisywania, w którym podczas dalszej archiwizacji i tworzeniu nowych plików archiwum, najstarsze archiwalne pliki są kasowane. |

|                 |                                                                                                                             |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------|
| D <sup>54</sup> | Pulsuje co 1 sek. Kopiowanie z pamięci wewnętrznej do pamięci archiwum plików. Pole wyświetla procentowy postęp kopiowania. |
| E               | Symbol połączenia Ethernetu                                                                                                 |
| R T             | Wskaźnik odbioru i nadawania danych na łączu RS485                                                                          |

## 5. TRYBY PRACY

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Miernik NR30 ma 9 trybów pracy:

**Pomiar** – tryb normalnej pracy. Wyświetlane są wartości wielkości wg stron zaprogramowanych fabrycznie lub skonfigurowanych przez użytkownika w trybie **Wyświetlanie**

**Parametry** – konfiguracja parametrów miernika,

**Alarmy** – konfiguracja alarmów Alarm 1, Alarm 2,

**Wyświetlanie** – konfiguracja wyświetlanych stron,

**Archiwizacja** – konfiguracja wielkości archiwizowanych,

**Ethernet** – konfiguracja parametrów interfejsu Ethernet,

**Modbus** – konfiguracja parametrów interfejsu RS485,

**Ustawienia** – ustawienia: hasło, język, czas, data,

**Informacje** – podgląd wersji programu, nr seryjnego, adresu MAC,

Aby wejść z trybu **Pomiar** w dowolny tryb należy nacisnąć przycisk  przez ok. 3 sekundy.

Przyciskami   wybrać odpowiedni tryb i zaakceptować przyciskiem 

Powrót do trybu pomiarowego odbywa się poprzez jednoczesne naciśnięcie przycisków  

| Parametry | Układ polaczen                         | Zakres pradowy                                                                                         | Napiecie L - N                                                          | Napiecie L - L                                  | VT pierwotne                                    | VT wtórne                                       | CT pierwotne                                                   | CT wtórne                        | Czas usredniania                    | Synch. usredniania        |
|-----------|----------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------|----------------------------------|-------------------------------------|---------------------------|
|           | 3Ph-4W<br>3Ph-3W<br>1Ph-2W             | ◇ 1 A<br>◆ 5 A                                                                                         | 057.7                                                                   | 100.0                                           | 0000100                                         | 00100.0                                         | 00005                                                          | 00005                            | ◆ 15 min<br>◇ 30 min<br>◇ 60 min    | ◆ brak<br>◇ z zegarem RTC |
| Alarmy    | Napiecie zaliscz 2                     | Napiecie zaliscz 5                                                                                     | Napiecie zaliscz 8                                                      | Prąd zaliscz 1-3                                | Prąd zaliscz 4-6                                | Prąd zaliscz 7-9                                | Kas. licz. energii                                             | Kas. wart. usred.                | Par. fabryczne                      |                           |
|           | ◆ U1<br>◇ U2<br>◇ U3                   | ◆ U1<br>◆ U2<br>◆ U3                                                                                   | ◆ U1<br>◇ U2<br>◆ U3                                                    | ◆ I1<br>◇ -I1<br>◇ I2<br>◇ -I2<br>◇ I3<br>◇ -I3 | ◆ I1<br>◇ -I1<br>◆ I2<br>◇ -I2<br>◇ I3<br>◇ -I3 | ◆ I1<br>◇ -I1<br>◇ I2<br>◇ -I2<br>◇ I3<br>◇ -I3 | ◆ Nie<br>◇ czynnej<br>◇ bierniej<br>◇ pozornej<br>◇ wszystkich | ◆ Nie<br>◇ Tak                   | ◆ Nie<br>◇ Tak                      |                           |
| Alarm 1   | Ustawienia                             | Dzialania logiczne<br>◆ C1<br>◇ C1 v C2 v C3<br>◇ C1 ^ C2 ^ C3<br>◇ (C1 ^ C2) v C3<br>◇ (C1 v C2) ^ C3 | Stan PK gdy AL zal.<br>◆ Wyl.<br>◇ Zal.                                 | Blok. wyłączenia AL<br>◆ Wyl.<br>◇ Zal.         | Sygnalizacja AL<br>◆ Wyl.<br>◇ Zal.             | Par. fabrycznie AL<br>◆ Nie<br>◇ Tak            | <b>Rys.8a. Matryca programowania</b>                           |                                  |                                     |                           |
| Alarm 2   | Warunek C1<br>Warunek C2<br>Warunek C3 | Wielkosc<br>◆ U1<br>◇ I1<br>◆ P1<br>◇ Q1<br>:<br>gg:mm                                                 | Typ warunku<br>◆ n_on<br>◆ noFF<br>◇ on<br>◇ oFF<br>◆ H_on<br>:<br>3_oF | Lo wartosc warunku[%]<br>+0099.0                | Hi wartosc warunku[%]<br>+0101.0                | Opozn. zal. war. [s]<br>0000                    | Opozn. wyl. war. [s]<br>0000                                   | Blok. pon. zal. war. [s]<br>0000 | Sygn.wyst. war.<br>◆ Wyl.<br>◇ Zal. |                           |

| Wyswietlanie | Ustawienia                 | Podswietlenie                                               | Czas do wyl. podsw [s]                                          | Wybor stron 22 / 23                                        | Par. fab. stor |
|--------------|----------------------------|-------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------|----------------|
|              |                            | ◆ Wyl.<br>◇ Zal.                                            | 0000                                                            | ◆ Strona 1<br>◇ Strona 2<br>◆ Strona 3<br>:<br>◆ Strona 23 | ◆ Nie<br>◇ Tak |
|              | Strona 1<br>:<br>Strona 22 | ...Strona 1<br>Pole wysw. 1<br>Pole wysw. 2<br>Pole wysw. 3 | ...Pole wysw. 1<br>◆ Off<br>◆ U1<br>◆ I1<br>◆ P1<br>:<br>◆ En S |                                                            |                |
|              |                            | ...Strona 23<br>H03<br>U1 % I1 %<br>U2 % I2 %<br>U3 % I3 %  |                                                                 |                                                            |                |

Rys.8b. Matryca programowania

|              |                    |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                  |                 |                   |                   |
|--------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|-------------------|
| Archiwizacja | Grupa 1<br>Grupa 2 | Typ arch.<br><input checked="" type="checkbox"/> n_on<br><input type="checkbox"/> noFF<br><input type="checkbox"/> on<br><input type="checkbox"/> oFF<br><input type="checkbox"/> H_on<br><input type="checkbox"/> :<br><input type="checkbox"/> 3_oF | Parametry<br><input checked="" type="checkbox"/> U1<br><input type="checkbox"/> I1<br><input type="checkbox"/> P1<br><input type="checkbox"/> Q1<br><input type="checkbox"/> S1<br><input type="checkbox"/> :<br><input type="checkbox"/> Kol. faz | Wyzwalanie<br><input checked="" type="checkbox"/> U1<br><input type="checkbox"/> I1<br><input type="checkbox"/> P1<br><input type="checkbox"/> Q1<br><input type="checkbox"/> S1<br><input type="checkbox"/> :<br><input type="checkbox"/> gg.mm | Interwał<br>[s] | Dolny Prog<br>[%] | Gorny Prog<br>[%] |
|              | Ustawienia<br>CSV  | Separator<br>pola<br><input checked="" type="checkbox"/> Przecinek<br><input type="checkbox"/> Srednik<br><input type="checkbox"/> Tabulator                                                                                                          | Sep. dzies.<br><input checked="" type="checkbox"/> Kropka<br><input type="checkbox"/> Przecinek                                                                                                                                                    |                                                                                                                                                                                                                                                  |                 |                   |                   |
|              | Czynności          | Kopiuje Arch.<br>do CSV<br><input checked="" type="checkbox"/> Nie<br><input type="checkbox"/> Tak                                                                                                                                                    | Kasuj<br>archiwum<br><input checked="" type="checkbox"/> Nie<br><input type="checkbox"/> Tak                                                                                                                                                       |                                                                                                                                                                                                                                                  |                 |                   |                   |

Rys.8c. Matryca programowania



|          |                                                            |                                                                   |                                         |                      |                             |                                      |                                        |                                                                                                                                                                                                                                           |                                 |                                  |  |
|----------|------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------|----------------------|-----------------------------|--------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------|--|
| Ethernet | Adresy                                                     | DHCP<br>⚡ Wyt.<br>⚡ Zal.                                          | Tryb<br>⚡ Auto<br>⚡ 10Mbps<br>⚡ 100Mbps | 000.000.000.000      |                             | 255.255.255.000                      | 000.000.000.000                        | 008.008.008.008                                                                                                                                                                                                                           | aa.bb.cc.00.21.01               |                                  |  |
|          | Uzyskane z DHCP lub wprowadzone ręcznie gdy DHCP wyłączone |                                                                   |                                         |                      |                             |                                      |                                        |                                                                                                                                                                                                                                           |                                 |                                  |  |
|          | Modbus TCP                                                 | Adres<br>001                                                      | Port<br>00502                           | Limit połączeń<br>1  | Czas oczekiwania [s]<br>001 |                                      |                                        |                                                                                                                                                                                                                                           |                                 |                                  |  |
|          | FTP                                                        | Port komend<br>00021                                              | Port danych<br>01025                    |                      |                             |                                      |                                        |                                                                                                                                                                                                                                           |                                 |                                  |  |
|          | WWW                                                        | Port<br>00080                                                     |                                         |                      |                             |                                      |                                        |                                                                                                                                                                                                                                           |                                 |                                  |  |
|          | MQTT *                                                     | Stan połączenia<br><br>- Rozłączenie<br>- Łączenie<br>- Połączono | Adres IP<br>000.000.000.000             | Numer portu<br>01883 | Czas publikacji [s]<br>0005 | Nazwa klienta<br>NR30IoT-MQTT-CLIENT | Nazwa publikacji<br>NR30IoT-MEAS-TOPIC | Parametry<br>⚡ Standardowe<br>⚡ Napięcia<br>⚡ Prądy<br>⚡ Moc<br>⚡ Energie<br>⚡ Pozostałe<br>⚡ Harmoniczne U1<br>⚡ Harmoniczne U2<br>⚡ Harmoniczne U3<br>⚡ Harmoniczne I1<br>⚡ Harmoniczne I2<br>⚡ Harmoniczne I3<br>⚡ Minima<br>⚡ Maksima | Wi/Wyl MQTT<br>⚡ Wyt.<br>⚡ Zal. | Zapisz do FRAM<br>⚡ Nie<br>⚡ Tak |  |

\* dostepne tylko w mierniku NR30IoT

Rys.8d. Matryca programowania

|            |       |      |                                                                                                                                                                                                                                        |                                                                                                                                                                                          |                                                                                     |
|------------|-------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Modbus     | Adres | 00L  | Prędkość                                                                                                                                                                                                                               | Tryb                                                                                                                                                                                     | Par. fab.                                                                           |
|            |       |      | <input type="checkbox"/> 4800 b/s<br><input checked="" type="checkbox"/> 9600 b/s<br><input type="checkbox"/> 192 kb/s<br><input type="checkbox"/> 384 kb/s<br><input type="checkbox"/> 576 kb/s<br><input type="checkbox"/> 1152 kb/s | <input checked="" type="checkbox"/> RTU BNC<br><input checked="" type="checkbox"/> RTU BNT<br><input checked="" type="checkbox"/> RTU BCT<br><input checked="" type="checkbox"/> RTU BNT | 42xx<br><input checked="" type="checkbox"/> Nie<br><input type="checkbox"/> Tak     |
| Ustawienia | Hasło | ---- | Język                                                                                                                                                                                                                                  | Czas                                                                                                                                                                                     | Par. fab.                                                                           |
|            |       |      | <input type="checkbox"/> English<br><input checked="" type="checkbox"/> Polski<br><input type="checkbox"/> Deutsch                                                                                                                     | 13.4Z                                                                                                                                                                                    | miernika<br><input checked="" type="checkbox"/> Nie<br><input type="checkbox"/> Tak |
| Informacje | Typ   | NR30 | Kod wykonania                                                                                                                                                                                                                          | Wersja loaders                                                                                                                                                                           | Wersja programu                                                                     |
|            |       |      | 1121                                                                                                                                                                                                                                   | 1.06                                                                                                                                                                                     | 0.80                                                                                |
|            |       |      | Adres MAC                                                                                                                                                                                                                              | Adres DHCP                                                                                                                                                                               | Adres IP                                                                            |
|            |       |      | aa:bb:cc:00:21:01                                                                                                                                                                                                                      | <input type="checkbox"/> W4<br><input checked="" type="checkbox"/> Z4                                                                                                                    | 000.000.000.000                                                                     |
|            |       |      | Numer serijny                                                                                                                                                                                                                          | Maska podsięci                                                                                                                                                                           | Brama domylna                                                                       |
|            |       |      | 18040001                                                                                                                                                                                                                               | 255.255.255.000                                                                                                                                                                          | 000.000.000.000                                                                     |
|            |       |      | Adres DNS                                                                                                                                                                                                                              |                                                                                                                                                                                          | Kod serwisowy                                                                       |
|            |       |      | Użytkownik z DHCP lub wprowadzone ręcznie przy DHCP-walidzacji                                                                                                                                                                         |                                                                                                                                                                                          | 13-464032E703642BC                                                                  |

Rys.8e. Matryca programowania

## 6. DANE TECHNICZNE

### Zakresy pomiarowe i dopuszczalne błędy podstawowe

Tablica 1

| Wielkość<br>mierzona                                    | Zakres pomiarowy                                                                                                                                       | L1 | L2 | L3 | $\Sigma$ | Klasa                       |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----------|-----------------------------|
| Prąd In<br>1 A~<br>5 A~<br>63 A~                        | 0,002 ..0,100..1,200 A<br>0,010 ..0,500.. 6,000 A<br>0,10 ..6,3 .. 70,00 A<br>...100,00 kA (tr <sub>I</sub> ≠1)                                        | •  | •  | •  |          | 0,2<br>wg PN-EN<br>61557-12 |
| Napięcie U L-N<br>57,7 V~<br>100 V~<br>230 V~<br>400 V~ | 5,700..11,500 ..70,000 V<br>11,000..20,000 ..120,00 V<br>23,000..46,000 .. 276,00 V<br>40,000..80,000 .. 480,00 V<br>...1920,0 kV                      | •  | •  | •  |          | 0,2<br>wg PN-EN<br>61557-12 |
| Napięcie U L-L<br>100 V~<br>170 V~<br>400 V~<br>690 V~  | 10,000 ..20,000..120,00 V<br>17,000 ..34,000..204,00 V<br>40,000..80,00 .. 480,00 V<br>69,000..138,00 .. 830,00 V<br>...1999,0 kV (tr <sub>U</sub> ≠1) | •  | •  | •  |          | 0,5<br>wg PN-EN<br>61557-12 |
| Moc czynna P                                            | -19999 MW .. 0,000 W ..<br>..19999 MW (tr <sub>U</sub> ≠1, tr <sub>I</sub> ≠1)                                                                         | •  | •  | •  | •        | 0,5<br>wg PN-EN<br>61557-12 |
| Moc bierna Q                                            | -19999 MVar .. 0,000 Var ..<br>..19999 MVar (tr <sub>U</sub> ≠1, tr <sub>I</sub> ≠1)                                                                   | •  | •  | •  | •        | 1 wg PN-EN<br>61557-12      |
| Moc pozorna S                                           | 0,000 .. 1999,9 VA ..<br>..19999 MVA (tr <sub>U</sub> ≠1, tr <sub>I</sub> ≠1)                                                                          | •  | •  | •  | •        | 0,5 wg<br>PN-EN<br>61557-12 |

|                                                                                              |                               |   |   |   |   |                             |
|----------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|-----------------------------|
| Energia czynna EnP<br>/ pobierana lub<br>oddawana /                                          | 0,0 .. 99 999 999, 9 kWh      |   |   |   | • | 0,2S wg PN-<br>EN 62053-22  |
| Energia bierna EnQ<br>/indukcyjna lub<br>pojemnościowa/                                      | 0,0 .. 99 999 999, 9 kVarh    |   |   |   | • | 1<br>wg PN-EN<br>61557-12   |
| Energia pozorna EnS                                                                          | 0,0 .. 99 999 999, 9 kVAh     |   |   |   | • | 0,5 wg<br>PN-EN<br>61557-12 |
| Współczynnik mocy<br>czynnej PF                                                              | <u>-1,00 .. 0 .. 1,00</u>     | • | • | • | • | 1 wg PN-EN<br>61557-12      |
| Współczynnik tg                                                                              | <u>-999,99 .. 0 .. 999,99</u> | • | • | • | • | 1 wg PN-EN<br>61557-12      |
| Częstotliwość f                                                                              | <u>45,000 ..65,000</u> Hz     |   |   |   | • | 0,1 wg<br>PN-EN<br>61557-12 |
| Współczynnik<br>zniekształceń<br>harmonicznych napięcia<br>THDU, prądu THDI                  | 0,0 .. 100,0 %                | • | • | • | • | 5<br>wg PN-EN<br>61557-12   |
| Amplitudy harmonicznych<br>napięcia $U_{h2} \dots U_{h63}$ ,<br>prądu $I_{h2} \dots I_{h63}$ | 0,0 .. 100,0 %                | • | • | • |   | II wg<br>IEC61000-<br>4-7   |

tr\_I - Przekładnia przekładnika prądowego = Prąd pierwotny przekładnika / Prąd wtórny przekładnika prądowego,

tr\_U - Przekładnia przekładnika napięciowego = Napięcie pierwotne przekładnika / Napięcie wtórne przekładnika napięciowego,

| Zaciski  |       | podłączenie<br>bezpośrednie (63A) | podłączenie<br>pośrednie (1/5A) |
|----------|-------|-----------------------------------|---------------------------------|
| Przekrój | drut  | 2.5 .. 16 mm <sup>2</sup>         | 0.2 .. 5.3 mm <sup>2</sup>      |
|          | linka | 4 .. 16 mm <sup>2</sup>           | 0.2 .. 5.3 mm <sup>2</sup>      |

**Wymiary** 105 x 110 x 60 mm

#### **Warunki odniesienia i znamionowe warunki użytkowania**

- napięcie zasilania: 85..253 V a.c. (40..50..400) Hz lub 90..300 V d.c. albo 20..40 V a.c. lub 20..60 V d.c. lub 20..60 V d.c.
- sygnał wejściowy: 0 ..  $0.1..1.2I_n$  dla wykonañ 1/5A;  
0 ..  $0.1..1.1I_n$  dla wykonañ 63A; 0; 1..0.2..1.2U<sub>n</sub> dla prądu, napięcia, PF<sub>i</sub>, tg<sub>i</sub>
- współczynnik mocy:  $-1..0..1$
- temperatura otoczenia: -10..23..+55 °C, klasa K55 wg PN-EN61557-12
- temperatura magazynowania: -20...+70°C
- wilgotność: 0 ..  $40..60$  ..95 % (niedopuszczalne skroplenia)
- dopuszczalny współczynnik szczytu :
  - natężenia prądu: 2
  - napięcia: 2
- zewnętrzne pole magnetyczne:  $\leq 40...400$  A/m d.c.  $\leq 3$  A/m a.c. 50/60 Hz
- przeciążalność krótkotrwała
- wejścia napięciowe 5 sek.: 2 Un
- wejścia prądowe 1 sek.: 50 A /dla wykonañ In 1A/5A /
- 1 sek. 630 A /dla wykonañ In 63A /
- pozycja pracy: dowolna
- czas nagrzewania: 15 min.

**Błędy dodatkowe w % błędu podstawowego:**

- od zmian temperatury otoczenia < 50 % / 10°C
- dla THD > 8% < 50 %

**Wymagania bezpieczeństwa:**

według normy PN-EN 61010-1

- izolacja między obwodami: podstawowa,
- kategoria instalacji III dla napięć względem ziemi do 300V
- kategoria instalacji II dla napięć względem ziemi do 600V
- stopień zanieczyszczenia 2,
- maksymalne napięcie pracy względem ziemi:
  - dla obwodów zasilania i wyjść przekaźnikowych 300 V
  - dla wejścia pomiarowego 500 V
  - dla obwodów RS485, Ethernet, wyjść analogowych: 50 V
- wysokość npm < 2000m,



## 1. BASIC REQUIREMENTS, OPERATIONAL SAFETY

---

In terms of operational safety, the meter meets the requirements of EN 61010-1.

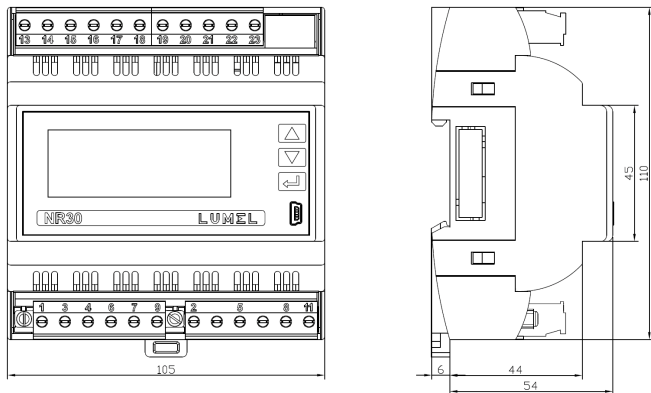
### **Safety instructions:**

- The meter installation and connection should be made by qualified personnel. All available protection requirements must be taken into consideration.
- Before turning the meter on verify the connections.
- Prior to removing the meter housing, always turn the supply off and disconnect the measurement circuits.
- Removal of the meter housing during the warranty period voids the warranty.
- The meter meets the requirements for electromagnetic compatibility in industrial environment.
- A switch or a circuit-breaker should be installed in the building or facility. It should be located near the device, easily accessible to the operator, and suitably marked.

## 2. INSTALLATION

The meter is adapted for installation in a modular installation switchgear on a 35 mm support rail.

Housing dimensions are 105 x 110 x 60 mm. Outside the meter there are screw terminal strips that allow connection of external wires with a cross-section up to 5.3 mm<sup>2</sup> / indirect measurements/ and up to 16 mm<sup>2</sup> /direct measurements/.



*Fig.1. Overall dimensions of NR30 meter*



### 3. ELECTRICAL CONNECTIONS

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See fig. 2-6, page 37.

### 4. NR30 PROGRAMMING

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NR30 meter has 3 buttons and a 20 x 4 LCD character display.

Description of the frontal panel:

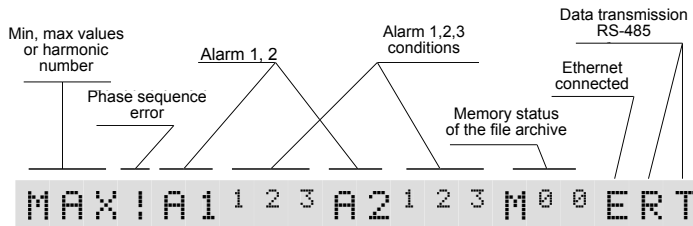
|                                                                                   |                                              |         |                                                   |
|-----------------------------------------------------------------------------------|----------------------------------------------|---------|---------------------------------------------------|
|  | value increase key and moving up             |         |                                                   |
|  | button to decrease the value and moving down |         |                                                   |
|  | accept key                                   |         |                                                   |
|  | USB socket                                   |         |                                                   |
| V,A,W,var,<br>VA, Wh,<br>varh,Hz,                                                 | units of displayed quantities                | k, M, G | kilo = $10^3$ , Mega = $10^6$ ,<br>Giga = $10^9$  |
| U1,I1,<br>P1, ...<br>..EnQ                                                        | Indications of displayed parameters          | L, C    | markers of the type of load inductive, capacitive |

The values of measured parameters are presented on active pages selected by subsequent pressing of the buttons  (next page)

 or (previous page).

Page size is determined by any 3 quantities selected from Table 1 and displayed on the screen. The page definition is described in the **Display** mode.

The information bar at the top of the screen shows the status of the alarm outputs, alarm conditions, file archive memory status, archiving status. There is also an Ethernet connection symbol on the information bar, indicators of receiving and transmitting data to the RS485 line. In the case of reverse phase sequence, the symbol „!” flashes. When displaying the minimum, maximum or harmonic values, the corresponding information appears.



*Fig.7. Information bar*

| Symbol                     | Information                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MIN<br>MAX                 | Pressing the  button displays the minimum, maximum or current value (no symbol) of the displayed quantity.                                                                                                                                                                                                       |
| !                          | If voltage signals are connected in reverse sequence, the symbol indicating the phase sequence error flashes.                                                                                                                                                                                                                                                                                     |
| A1, A2                     | Status of alarm outputs. In the event of an alarm (s), the corresponding symbols are displayed.                                                                                                                                                                                                                                                                                                   |
| 1 2 3                      | Signaling of meeting the alarm conditions                                                                                                                                                                                                                                                                                                                                                         |
| File archive memory status |                                                                                                                                                                                                                                                                                                                                                                                                   |
| M <sup>00</sup>            | Percentage of usage of the file archive memory, e.g. M <sup>28</sup>                                                                                                                                                                                                                                                                                                                              |
| M?                         | Lack of archive memory or incorrect archive memory file system.                                                                                                                                                                                                                                                                                                                                   |
| F <sup>97</sup>            | It blinks every 1 second. Less than 7% of free space left in the file archive memory. Time to complete filling the archive of files about 14 days at 1 sec. interval. Immediately delete unnecessary files via FTP. When the file archive is full to 95%, the overwrite mode is started, in which during further archiving and creating new archive files, the oldest archived files are deleted. |
| D <sup>54</sup>            | It blinks every 1 second. Copying from internal memory to the file archive memory. The field displays the percentage of copying progress.                                                                                                                                                                                                                                                         |
| E                          | Ethernet connection symbol                                                                                                                                                                                                                                                                                                                                                                        |
| R T                        | Indicator of receiving and transmitting data to the RS485 line                                                                                                                                                                                                                                                                                                                                    |

## 5. OPERATING MODES

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The NR30, NR30IoT meters have 9 operating modes:

**Measurement** – normal operation mode. The values of quantities are displayed according to pre-programmed pages or pages configured by the user in the Displaying mode.

**Parameters** – configuration of parameters of the meter,

**Alarms** – alarm configuration Alarm 1, Alarm 2,

**Displaying** – configuration of displayed pages,

**Archiving** – configuration of archived quantities,

**Ethernet** – configuration of Ethernet interface parameters,

**Modbus** – configuration of RS485 interface parameters,

**Settings** – settings: password, language, time, date,

**Information** – preview of program version, serial no., MAC address,

To enter from the **Measurement** mode into any mode, press and hold the  button for about 3 seconds.

Use buttons   to select the appropriate mode and accept with  .

Return to the measuring mode is done by pressing at the same time   .

|            |                                               |                                                                                               |                                              |                                                                       |                                                                 |                                                                 |                                                                         |                                  |                                                     |                                             |
|------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------|---------------------------------------------|
| Parameters | Connection wire<br>3Ph-4W<br>3Ph-3W<br>1Ph-2W | Current range<br>◇1 A<br>◆5 A                                                                 | Voltage L- N<br>057.7                        | Voltage L- L<br>100.0                                                 | VT primary<br>0000100                                           | VT secondary<br>00100.0                                         | CT primary<br>00005                                                     | CT secondary<br>00005            | Demand integ. time<br>◆15 min<br>◇30 min<br>◇60 min | AVG synchronization<br>◆ none<br>◇ with RTC |
|            | Volt. Connector 2<br>◆U1<br>◇U2<br>◇U3        | Volt. connector 5<br>◆U1<br>◆U2<br>◇U3                                                        | Volt. Connector 8<br>◇U1<br>◇U2<br>◆U3       | Curr connector 1-3<br>◆I1<br>◆-I1<br>◇I2<br>◆-I2<br>◇I3<br>◆-I3       | Curr connector 4-6<br>◆I1<br>◆-I1<br>◇I2<br>◆-I2<br>◇I3<br>◆-I3 | Curr connector 7-9<br>◆I1<br>◆-I1<br>◇I2<br>◆-I2<br>◆I3<br>◆-I3 | Del energy counters<br>◆No<br>◇active<br>◇reactive<br>◇apparent<br>◇all | Del demand values<br>◆No<br>◇Yes | Set defaults<br>◆No<br>◇Yes                         |                                             |
| Alarms     | Settings                                      | Logical conditions<br>◆C1<br>◇C1 v C2 v C3<br>◇C1 ▲ C2 ▲ C3<br>◇C1 ▲ C2 v C3<br>◇C1 v C2 ▲ C3 | RLY state if AL on.<br>◆off<br>◇on           | Holdback alarm off<br>◆off<br>◇on                                     | Disp. alarm event<br>◆off<br>◇on.                               | Set AL defaults<br>◆No<br>◇Yes                                  | <i>Fig.8a. Programming matrix</i>                                       |                                  |                                                     |                                             |
|            |                                               | Alarm 1                                                                                       |                                              |                                                                       |                                                                 |                                                                 |                                                                         |                                  |                                                     |                                             |
|            | Alarm 2                                       | Condition C1<br>Condition C2<br>Condition C3                                                  | Values<br>U1<br>I1<br>P1<br>Q1<br>:<br>gg:mm | Condition type<br>◆IL on<br>◆noFF<br>◇on<br>◇off<br>H_on<br>:<br>3_oF | Lo limit condition[%]<br>+0099.0                                | Hi limit condition [%]<br>+0101.0                               | Delay condition on [s]<br>0000                                          | Delay condition off [s]<br>0000  | Hidbk cond. off-on [s]<br>0000                      | Display cond. event<br>◆off<br>◇On          |

|            |                        |                                                                     |                                         |                                                                     |                                  |
|------------|------------------------|---------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------|----------------------------------|
| Displaying | Settings               | Backlight<br>◆off<br>◆on                                            | Backlight off time [s]<br>0000          | Pages cfg 22 / 23<br>◆Page 1<br>◇Page 2<br>◆Page 3<br>:<br>◆Page 23 | Set page defaults<br>◆No<br>◆Yes |
|            | Page 1<br>:<br>Page 22 | ... Page 1<br>Display field 1<br>Display field 2<br>Display field 3 | ◆Off<br>◆U1<br>◆I1<br>◆P1<br>:<br>◆En S | <i>Fig.8b. Programming matrix</i>                                   |                                  |
|            |                        | ... Page 23<br>H03<br>U1 % I1 %<br>U2 % I2 %<br>U3 % I3 %           |                                         |                                                                     |                                  |

|           |                    |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                               |                          |                                |                                 |
|-----------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------|---------------------------------|
| Archiving | Group 1<br>Group 2 | Archive type<br><input checked="" type="checkbox"/> n_on<br><input type="checkbox"/> noFF<br><input type="checkbox"/> on<br><input type="checkbox"/> oFF<br><input type="checkbox"/> H_on<br><input type="checkbox"/> :<br><input type="checkbox"/> 3_oF | Parametr<br><input checked="" type="checkbox"/> U1<br><input type="checkbox"/> I1<br><input type="checkbox"/> P1<br><input type="checkbox"/> Q1<br><input type="checkbox"/> S1<br><input type="checkbox"/> :<br><input checked="" type="checkbox"/> Kol. faz | Trigger<br><input checked="" type="checkbox"/> U1<br><input type="checkbox"/> I1<br><input type="checkbox"/> P1<br><input type="checkbox"/> Q1<br><input type="checkbox"/> S1<br><input type="checkbox"/> :<br><input type="checkbox"/> gg:mm | Interval [s]<br><br>0001 | Archive low [%]<br><br>+0000.0 | Archive high [%]<br><br>+0000.0 |
|           | CSV Settings       | Value separator<br><input checked="" type="checkbox"/> Comma<br><input type="checkbox"/> Semicolon<br><input type="checkbox"/> Tabulator                                                                                                                 | Decimal separator<br><input checked="" type="checkbox"/> Dot<br><input type="checkbox"/> Comma                                                                                                                                                               |                                                                                                                                                                                                                                               |                          |                                |                                 |
|           | Actions            | Copy arch. to CSV<br><input checked="" type="checkbox"/> No<br><input type="checkbox"/> Yes                                                                                                                                                              | Clear archive<br><input checked="" type="checkbox"/> Nie<br><input type="checkbox"/> Tak                                                                                                                                                                     |                                                                                                                                                                                                                                               |                          |                                |                                 |

Fig.8c. Programming matrix

|          |            |                                                                               |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|----------|------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------|-------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Ethernet | Addresses  | DHCP<br><input type="radio"/> Deact.<br><input checked="" type="radio"/> Act. | Mode<br><input type="radio"/> Auto<br><input checked="" type="radio"/> 10Mbps<br><input type="radio"/> 100Mbps | IP Address<br><u>000.000.000.000</u> | Subnet mask<br><u>255.255.255.000</u> | Gateway address<br><u>000.000.000.000</u> | DNS Address<br><u>008.008.008.000</u> | MAC Address<br><u>aa.bb.cc.00.21.01</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                       |
|          |            | Acquired from DHCP or entered manually when DHCP is deactivated.              |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          |            |                                                                               |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          | Modbus TCP | Address<br><u>001</u>                                                         | Port<br><u>00502</u>                                                                                           | Max. connection limit<br><u>1</u>    | Waiting time [s]<br><u>001</u>        |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          |            |                                                                               |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          | FTP        | Command port<br><u>00021</u>                                                  | Data port<br><u>01020</u>                                                                                      |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          |            |                                                                               |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          | WWW        | Port<br><u>00080</u>                                                          |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          |            |                                                                               |                                                                                                                |                                      |                                       |                                           |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |
|          | MQTT *     | Connection status<br><br>- Disconnected<br>- Connecting<br>- Connected        | IP Address<br><br><u>000.000.000.000</u>                                                                       | Port no.<br><br><u>01880</u>         | Publish time [s]<br><br><u>0000</u>   | Client name<br><br>NR30IoT-MQTT-CLIENT    | Topic Name<br><br>NR30IoT-MEAS-TOPIC  | Parameters<br><br><input checked="" type="radio"/> standard<br><input type="radio"/> Voltages<br><input type="radio"/> Currents<br><input type="radio"/> Powers<br><input type="radio"/> Energies<br><input type="radio"/> others<br><input type="radio"/> Harmonics U1<br><input type="radio"/> Harmonics U2<br><input type="radio"/> Harmonics U3<br><input type="radio"/> Harmonics I1<br><input type="radio"/> Harmonics I2<br><input type="radio"/> Harmonics I3<br><input type="radio"/> Minimums<br><input type="radio"/> Maximums | MQTT On / Off<br><br><input type="radio"/> Off<br><input checked="" type="radio"/> On |

\* only in NR30IoT

Fig.8d. Programming matrix

|        |             |      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |              |      |                 |                                                                                                                                               |               |          |             |                   |                                                                                               |                                                                                               |          |                 |             |                 |                 |                 |             |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------|-------------|------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|-------------|-------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------|-----------------|-------------|-----------------|-----------------|-----------------|-------------|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Modbus | Address     | 001  | Baudrate   | <div><div><div><div><div></div><div>4800 b/s</div></div><div><div></div><div>9600 b/s</div></div><div><div></div><div>19.2 k/s</div></div><div><div></div><div>38.4 k/s</div></div><div><div></div><div>57.6 k/s</div></div><div><div></div><div>115.2 k/s</div></div></div><div><div></div><div>RTU 8N2</div></div><div><div></div><div>RTU 8N1</div></div><div><div></div><div>RTU 8O1</div></div><div><div></div><div>RTU 8N1</div></div></div></div> <div>Mode</div> <div><div><div><div></div><div>42x</div></div><div><div></div><div>Yes</div></div><div><div></div><div>Parity</div></div><div><div></div><div>Stop bit</div></div></div><div>Set defaults</div></div> | Settings | Password     | ...  | Language        | <div><div><div><div></div><div>English</div></div><div><div></div><div>Polski</div></div><div><div></div><div>Deutsch</div></div></div></div> | Time          | 13.4Z    | Date        | 15/05/2018        | <div><div><div><div></div><div>No</div></div><div><div></div><div>Yes</div></div></div></div> |                                                                                               |          |                 |             |                 |                 |                 |             |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        | Type        | NR30 | Order code | 1121                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          | Boot version | 1.06 | Program version | 0.80                                                                                                                                          | Serial number | 18040001 | MAC address | aa:bb:cc:02:10:11 | DHCP                                                                                          | <div><div><div><div></div><div>off</div></div><div><div></div><div>on</div></div></div></div> | Adres IP | 000.000.000.000 | Subnet mask | 255.255.255.000 | Gateway Address | 000.000.000.000 | DNS address | 124.484.038.FC39A.035C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|        | Information |      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |              |      |                 |                                                                                                                                               |               |          |             |                   |                                                                                               |                                                                                               |          |                 |             |                 |                 |                 |             |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Fig. 8e. Programming matrix



## 6. TECHNICAL DATA

### Measurement ranges and acceptable errors

Table 1

| Measured quantity                                    | Measuring range                                                                                                                            | L1 | L2 | L3 | $\Sigma$ | Class                          |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----------|--------------------------------|
| Current In 1 A~<br>5 A~<br>63 A~                     | 0.002 ..0.100..1.200 A<br>0.010 ..0.500.. 6.000 A<br>0.10 ..6.3 .. 70.00 A<br>...100.00 kA (tr_l#1)                                        | •  | •  | •  |          | 0.2<br>acc. to<br>EN 61557-12  |
| Voltage U L-N 57.7 V~<br>100 V ~<br>230 V~<br>400 V~ | 5.700..11.500 ..70.000 V<br>11.000..20.000 ..120.00 V<br>23.000..46.000 .. 276.00 V<br>40.000..80.000 .. 480.00 V<br>...1920.0 kV          | •  | •  | •  |          | 0.2<br>acc. to<br>EN 61557-12  |
| Voltage U L-L 100 V~<br>170 V~<br>400 V~<br>690 V~   | 10.000 ..20.000..120.00 V<br>17.000 ..34.000..204.00 V<br>40.000..80.00 .. 480.00 V<br>69.000..138.00 .. 830.00 V<br>...1999.0 kV (tr_U#1) | •  | •  | •  |          | 0.5<br>acc. to<br>EN 61557-12  |
| Active power P                                       | -19999 MW .. 0.000 W ..<br>..19999 MW (tr_U#1.tr_l#1)                                                                                      | •  | •  | •  | •        | 0.5 acc. to<br>EN 61557-12     |
| Reactive power Q                                     | -19999 MVar .. 0.000 Var ..<br>..19999 MVar (tr_U#1.tr_l#1)                                                                                | •  | •  | •  | •        | 1 acc. to<br>EN 61557-12       |
| Apparent power S                                     | 0.000 .. 1999.9 VA ..<br>..19999 MVA (tr_U#1.tr_l#1)                                                                                       | •  | •  | •  | •        | 0.5 acc. to<br>EN 61557-12     |
| Active energy EnP<br>/ imported or exported /        | 0.0 .. 99 999 999. 9 kWh                                                                                                                   |    |    |    | •        | 0.2S<br>acc. to EN<br>62053-22 |

|                                                                                                   |                               |   |   |   |   |                                |
|---------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|--------------------------------|
| Reactive energy EnQ<br>/Inductive or<br>capacitive/                                               | 0.0 .. 99 999 999. 9<br>kVarh |   |   |   | • | 1 acc. to<br>EN 61557-12       |
| Apparent energy EnS                                                                               | 0.0 .. 99 999 999. 9<br>kVAh  |   |   |   | • | 0.5 acc. to<br>EN 61557-12     |
| Power factor active<br>PF                                                                         | <u>-1.00 .. 0 .. 1.00</u>     | • | • | • | • | 1 acc. to<br>EN 61557-12       |
| tg factor                                                                                         | <u>-999.99 .. 0 .. 999.99</u> | • | • | • | • | 1 acc. to<br>EN 61557-12       |
| Frequency f                                                                                       | <u>45.000 .. 65.000</u> Hz    |   |   |   | • | 0.1 acc. to<br>EN 61557-12     |
| Total harmonic<br>distortion of voltage<br>THDU, and current<br>THDI                              | 0.0 .. 100.0 %                | • | • | • | • | 5 acc. to<br>EN 61557-12       |
| Amplitudes of voltage<br>harmonics $U_{h2} \dots U_{h63}$ ,<br>and current $I_{h2} \dots I_{h63}$ | 0.0 .. 100.0 %                | • | • | • |   | II<br>acc. to<br>IEC61000-4-7) |

tr\_I - Ratio of current transformer = Primary current of transformer / Secondary current of current transformer,

tr\_U - Ratio of voltage transformer = Primary voltage of transformer / Secondary voltage of voltage transformer,

### Terminals

direct connection (63A)

indirect connection (1/5A)

### Cross-section

wire 2.5 .. 16 mm<sup>2</sup>

0.2 .. 5.3 mm<sup>2</sup>

cable 4 .. 16 mm<sup>2</sup>

0.2 .. 5.3 mm<sup>2</sup>

|                        |               |        |
|------------------------|---------------|--------|
| <b>Clamping screws</b> | M5            | M3.5   |
| Tightening torque      | 1.2 .. 2.0 Nm | 1.0 Nm |

### Dimensions

105 x 110 x 60 mm

### Reference conditions and rated operating conditions

- power supply: 85..253 V a.c. (40..50..400) Hz or 90..300 V d.c. or 20..40 V a.c. or 20..60 V d.c. lub 20..60 V d.c.
- input signal: 0 ..  $0.1..1.2I_n$  for versions 1/5A;  
0 ..  $0.1..1.1I_n$  for versions 63A;  $0.1..0.2..1.2U_n$  for current, voltage,  $PF_i$ ,  $t_g$
- power factor: -1...0...1
- ambient temperature: -10..23..+55 °C, class K55 acc. to EN61557-12
- storage temperature : -20...+70°C
- humidity: 0 .. 40...60 ..95 % (no condensation)
- acceptable crest factor:
  - current: 2
  - voltage: 2
- external magnetic field:  $\leq 40...400$  A/m d.c.  $\leq 3$  A/m a.c. 50/60 Hz
- short-term overload  
voltage inputs 5 sec. : 2  $U_n$   
current inputs 1 sec.: 50 A /for versions **In** 1A/5A /  
1 sec. 630 A /for versions **In** 63A /
- operation position: any
- warm-up time: 15 min.

## EN

**Additional errors** in % of intrinsic error:

- due to ambient temperature changes < 50 % / 10°C
- for THD > 8% < 50 %

### **Safety requirements:**

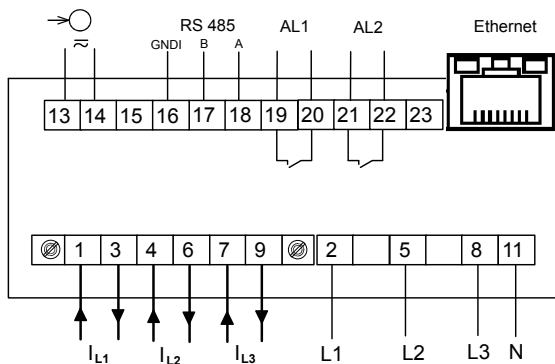
according to EN 61010-1 standard

- insulation between circuits: basic,
- installation category III for voltages up to 300V in relation to earth
- installation category II for voltages up to 600V in relation to earth
- degree of pollution 2,
- maximum operating voltage relative to earth:
  - for power circuits and relay outputs 300 V
  - for measurement input 500 V
  - for RS485, Ethernet circuits, analog outputs 50 V
- altitude < 2000m,

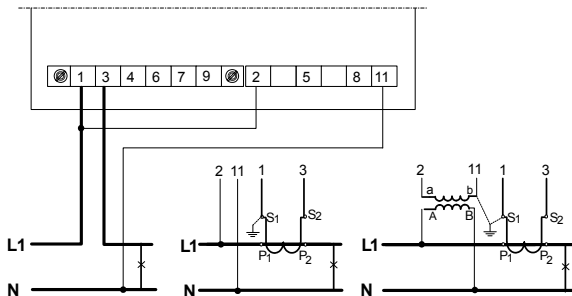
## SCHEMATY PODŁĄCZEŃ | ELECTRICAL CONNECTIONS

a) miernik w wykonaniu do podłączeń pośrednich (1 / 5 A)

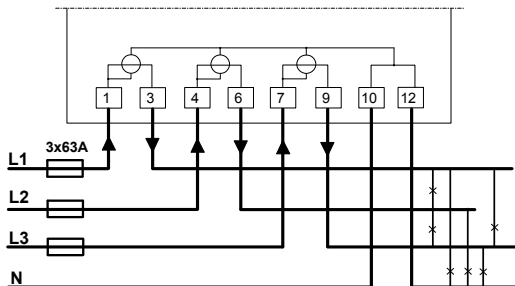
a) meter in execution for indirect connections (1 / 5 A)







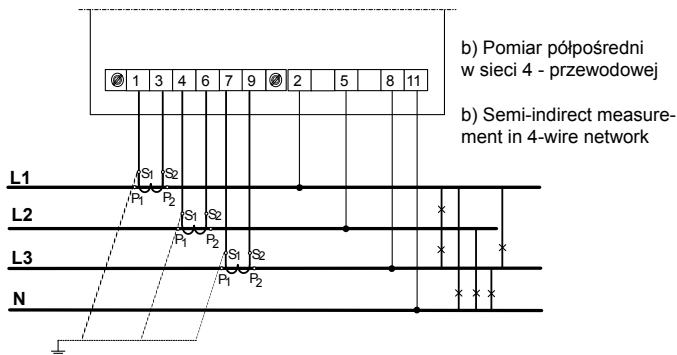
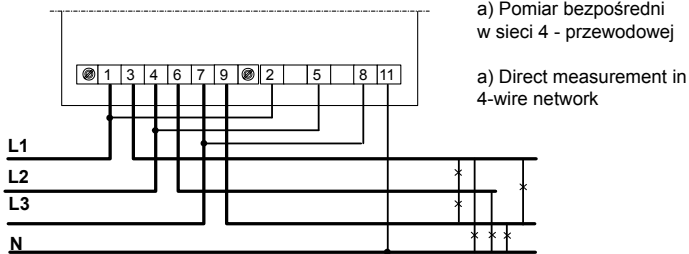
Rys.3. Pomiar bezpośredni, półpośredni i pośredni w sieci 1-fazowej  
 Fig. 3. Direct, semi-indirect & indirect measurement in 1-phase network.



Rys.4. Pomiar bezpośredni w sieci 4-przewodowej w wykonaniu 63 A.  
 Fig.4. Direct measurement in 4-wire network in meter execution 63 A.

PL

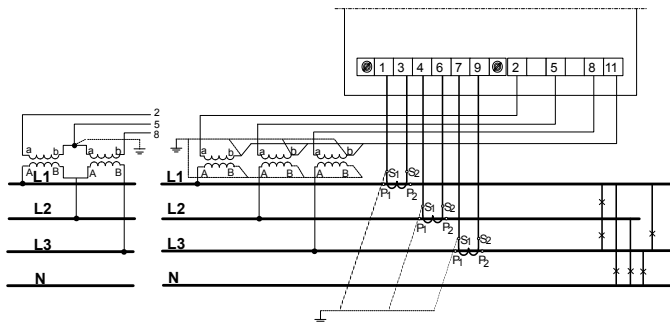
EN





c) Pomiar pośredni w sieci 4 - przewodowej

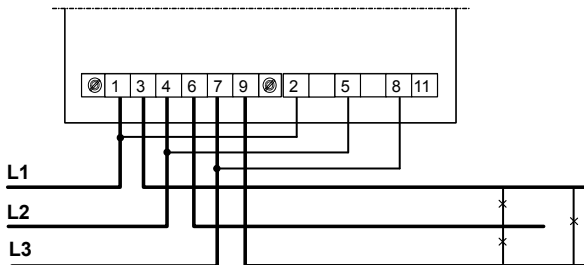
c) Indirect measurement in 4-wire network



Rys.5. Podłączenia sygnałów wejściowych w sieci trójfazowej 4 – przewodowej  
Fig.5. Connection of input signals in a three-phase 4-wire network

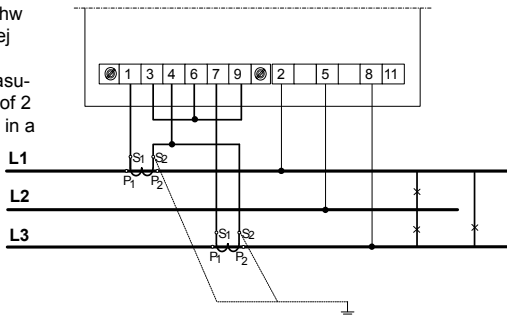
a) Pomiar bezpośredni w sieci 3 - przewodowej

a) Direct measurement in 3-wire network



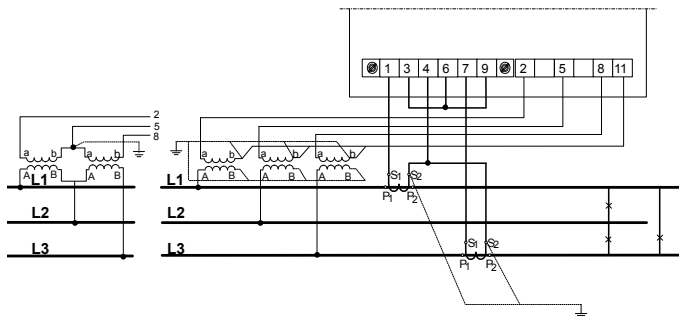
b) Pomiar półpośredni z wykorzystaniem 2 przekładników prądowych sieci 3 - przewodowej

b) Semi-indirect measurement with the use of 2 current transformers in a 3-wire network



c) Pomiar półpośredni z wykorzystaniem 2 przekładników prądowych i 2 lub 3 przekładników napięciowych w sieci 3 - przewodowej

c) Semi-indirect measurement with the use of 2 current transformers and 2 or 3 voltage transformers in a 3-wire network



Rys.6. Podłączenia sygnałów wejściowych w sieci trójfazowej 3 – przewodowej  
Fig.6. Connection of input signals in a three-phase 3-wire network

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**NR30IoT-07-09B**  
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