USER MANUAL

SONEL PQDif CONVERTER
Applies to power quality analyzers:
PQM-702(T) ● PQM-703 ● PQM-710 ● PQM-711

PQDif standard:
v1.6, 25.07.2015

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1   Informacje podstawowe

Aplikacja Sonel PQDif Converter została stworzona jako rozszerzenie możliwości analizatorów PQM. Współpracuje wyłącznie z danymi zarejestrowanymi za pomocą analizatorów PQM klasy A oraz zapisanymi za pomocą dedykowanego oprogramowania Sonel Analiza. Przeznaczeniem konwertera jest rozszerzenie możliwości współpracy analizatorów z innymi systemami poprzez przenoszenie wyników pomiarów za pomocą uniwersalnego formatu wymiany danych PQDif.

Istnieją dwie możliwości obsługi programu:
o   manualna w trybie interfejsu graficznego
o   z linii komend (CLI), aby w trybie wsadowym automatycznie przetwarzać dane na podstawie skryptu.

Wybór następuje przez uruchomienie odpowiedniego pliku .exe programu. Ze względu na duże zróżnicowanie pomiędzy możliwościami rejestracji analizatorów PQM a ograniczeniami wynikającymi ze standardu PQDif – wprowadzono możliwość wyboru przez użytkownika zakresu eksportowanych danych. Program zapewnia dostęp zarówno do danych diagnostycznych użytkownika, jak i danych zarejestrowanych według wymagań normy, jeżeli takie zostały zapisane. Wynika to z faktu, że analizatory PQM klasy A umożliwiają rejestrację dualną, czyli jednoczesną rejestrację dla dwóch różnych kryteriów.

2   Instalacja oprogramowania

Instalacja oprogramowania polega na uruchomieniu pliku instalacyjnego i odpowiedzi na pojawiające się pytania w trakcie instalacji. Instalator pozwala na wybór, czy ma zostać utworzona grupa oraz skrót do programu w menu Start systemu Windows, oraz czy ikona programu ma być umieszcza na pulpicie. Na zakończenie instalacji pojawia się możliwość pierwszego uruchomienia, z której należy skorzystać w procesie instalacji, ponieważ zostanie wywołany jednorazowy proces autoryzacji praw do korzystania z tego oprogramowania. Program z powodów licencyjnych zabezpieczony jest kluczem wprowadzanym podczas pierwszej poprawnej instalacji. Wszystkie przypadki uruchomienia bez autoryzacji kończą się informacją o konieczności jej wykonania, po czym działanie programu zostaje przerwane.
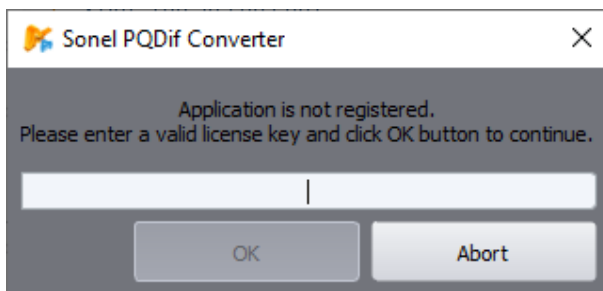
Rys. 1. Okno autoryzacji licencji

Okno autoryzacji (Rys. 1) pojawia się podczas pierwszego uruchomienia programu. W polu edycyjnym należy wprowadzić ciąg tekstowy klucza **xxxx-xxxx-xxxx-xxxx-xxxx** otrzymany od dostawcy. Po wybraniu **OK** licencja zostanie zweryfikowana i zapisana dla aktualnego użytkownika komputera. Kolejne uruchomienia programu pomijają etap autoryzacji - po weryfikacji już zainstalowanego klucza aplikacja przechodzi do normalnego działania. W razie problemów z autoryzacją należy skontaktować się ze sprzedawcą.

3   Operation via the graphical user interface

The graphical interface allows user to manually select each of the options available on the screen. Additional descriptions and some program features may be saved as default settings - they will be used automatically each time you run the program.

3.1   Starting the application

The application is started by double-clicking the program icon (Fig. 2) on the Windows desktop. You can also start the program from the folder menu: Programs > SONEL.
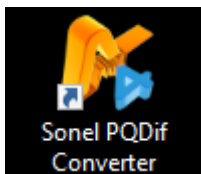
Fig. 2. Icon on the desktop

Start window of the program (Fig. 3) allows user to select the language, and then to indicate the data source.
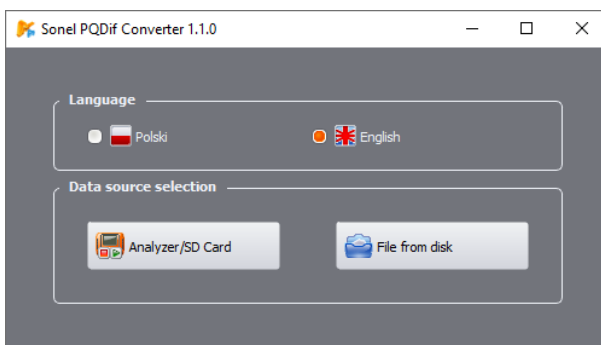
Fig. 3. Window with language and data source selection

Data can be downloaded directly from the analyzer or from a previously saved file with measurements, in both versions: packed *.pqm7xx and database *.analysis. Direct data download from the device is possible only for the following analyzer types: PQM-702 / 702T / 703 / 710 / 711. If you experience problems downloading the data from the analyzer - e.g. lost connection - you should check whether an update is available for converter software. If you still have problems, please contact the manufacturer.

3.2 Downloading data for conversion

3.2.1 From connected analyzer

When downloading data from the analyzer, the software searches the database of analyzers in Sonel Analysis using all defined communication links. **Connection** window displays the list of analyzers currently available analyzers (Fig. 4) via active communication links.

The data can be downloaded directly from the analyzer using TCP/IP protocol via GSM or Wi-Fi - but only when these media were active in Sonel Analysis before activating the converter (Program settings> Media settings). If Sonel Analysis is not installed, data from the analyzer may be downloaded only via USB port.
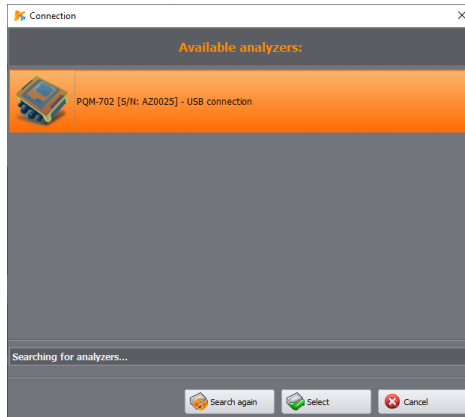
Fig. 4. Selection window with analyzers available for data download

After selecting the analyzer from the list and confirming the choice (**Select**), the window for storing data in memory is displayed (Fig. 5). Use **Search again** button to refresh the list of available analyzers. It is especially useful for remote connections over long distances.
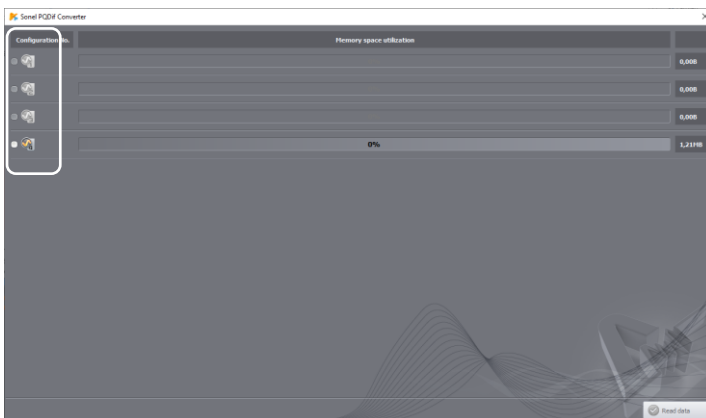
Fig. 5. Window with memory space in the selected meter

Select one of four memory areas, which includes data you want to read and mark it as active in the area shown in Fig. 5, then press **Read data** button.

Fig. 6. Window informing about switching memory in fast mode

For data exceeding 1 MB, the software automatically switches the analyzer in mass storage mode, which provides a much higher download speed, which will be signalled by an additional information window (Fig. 6).
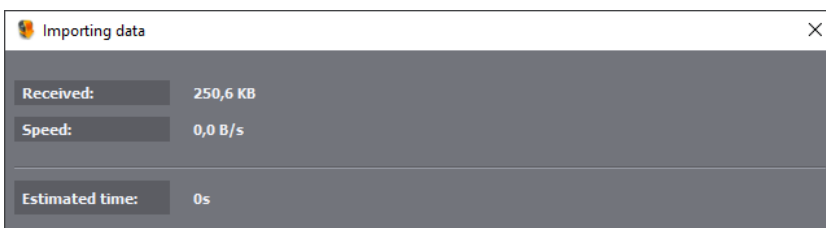
Fig. 7. Window informing about importing data progress

The window (Fig. 7) will display current status of data download process: the amount of received data, the average transfer speed and estimated time for completing the download. The window is always displayed for data import, even for measurements less than 1 MB.

After downloading the data in mass-storage mode, a pop-up window is briefly displayed to inform about switching from storage to direct communication mode. At the end of data download, a window with detailed memory content is displayed (Fig. 8), showing a graphical presentation of the measurements available for various configurations. Proceed in the same way as in case of opening a packed file *.PQM7xx, which is described in **sec. 3.3**.

3.3 * Opening a packed file *.PQM7xx

After downloading the data from the file, a window for selecting files and folders is shown to enable the user searching and selecting the desired file with measurements. After selecting a packed file (with *.pqm7xx extension), a window is displayed to select specific measurement to be converted (Fig. 8), similarly as at the end of data directly from the analyzer. Depending on the number of settings used, up to four horizontal bars will represent the collected data.

Select one of the available areas as active, which is confirmed in orange. Use also "**S**" and "**E**" sliders at the upper part to limit the time interval of collected data. "Configuration" tab available on the left side of the screen presents details on start and end times of data registration for each measuring configuration.
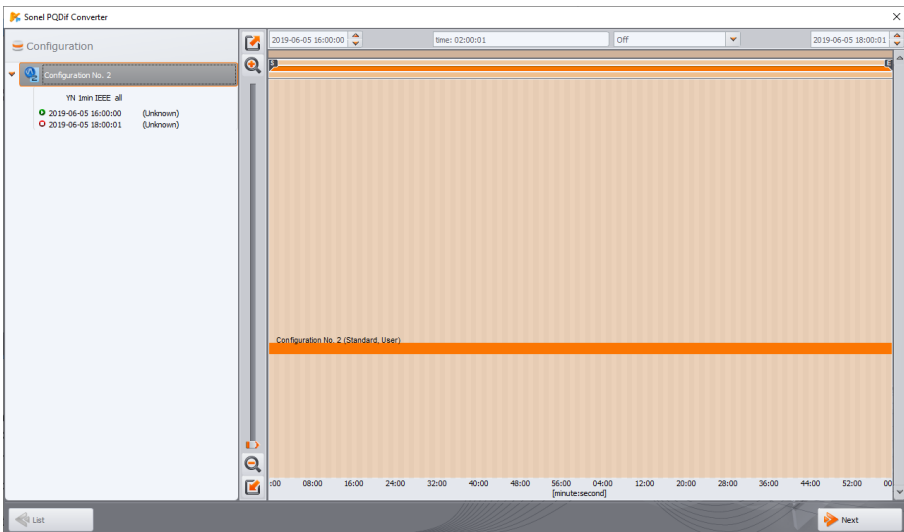
Fig. 8. Window with detailed selection of the measurement to be converted

After selecting time interval data, as shown in Fig. 8 use **Next** button to start unpacking and importing measurement data. The progress of data download is indicated by bar at the bottom of the window, and unpacked data are transferred to a temporary file on the local disk.

In the case of very large volumes of files, wait until the end of the process - even tens of minutes, depending on the recorded content. Particularly large influence on downloading duration has a high number of events involving waveforms (transients) and the waveforms at the end of the averaging period located after 90% point on progress bar. Download completion is indicated by displaying the main window of the program (Fig. 9).

When you indicate a file with .analysis extension, then the program will download previously unpacked file much faster and then it will go directly to the main window of the converter (Fig. 9.) described in sec. 3.4.

3.4 Converting to PQDif files

Analyzers PQM-702 / 702T / 703 / 710 / 711 are able to record parameters from START to STOP simultaneously (duality, dual registration), according to two independent criteria: **STANDARD** and

USER, unless the configuration settings exclude one of these criteria sets. Therefore, start with selecting the data area, which you want to convert.

Additionally, as the variety of parameters recorded by PQM analyzers is beyond the specifications of PQDif standard in version 1.6 of 25.07.2015, all additional parameters are converted with their own names after selecting option **Additional parameters** in section **Data selection**. It is also possible to add for the conversion files prepared statistics in form of histograms, but the time needed for their conversion may significantly affect the total conversion time.
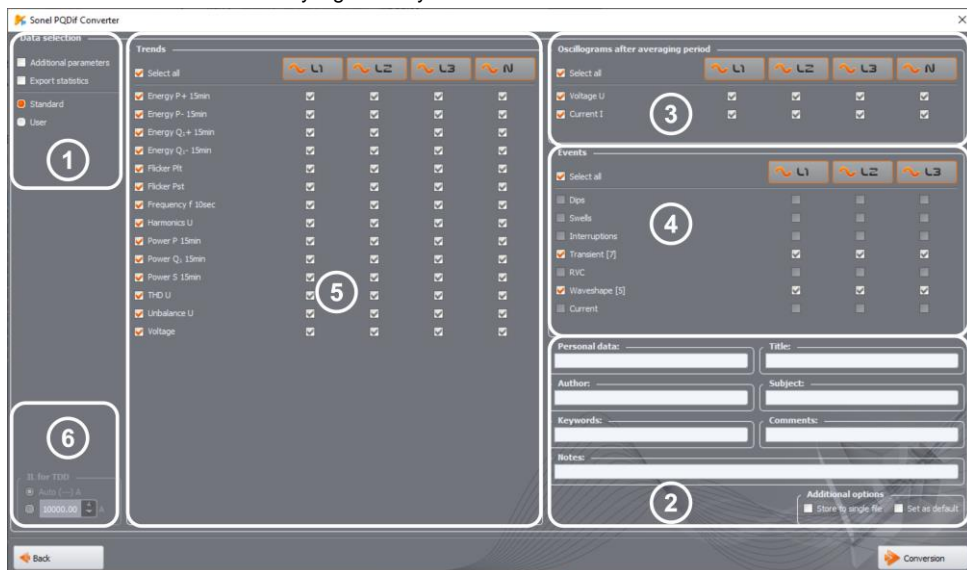
Fig. 9. The main operational window of the converter

The main window has 6 configuration areas, which should be completed before the data conversion.

3.4.1 Data Selection (area 1)

Because of the recording duality, i.e. simultaneous recording for the need of standard and for the need of user, the converter software (Fig. 10) allows user to choose data space and range to be converted:

- **Standard** - data chosen according to criteria of the standard selected before recording,
- **User** - recording with user settings

Additional parameters – this option allows exporting data with own data names that are not specified in the basic standard of PQDif.

Export statistics – it supplements the exported data with calculated histogram statistics. This significantly improves the file volume and conversion time.
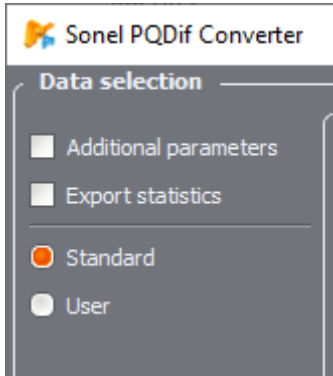
Fig. 10. Data selection

3.4.2 Additional Information (area 2)

Fig. 11. Area for additional information describing PQDif files

Area 2. (Fig. 11.) - it is used to enter additional information attached to the generated PQDif file. Additional options allow user to choose whether each of the parameter groups is to be saved as separate files or all of them in one file. User can also store additional information that can be automatically attached to next PQDif files generated by the program.

Additional information fields should be filled as described above. When **Set as default** is selected before the conversion, then the program will save the selected items and additional information - they will be used by as default during next program activations.

3.4.3 Waveforms after averaging period (area 3)

Analyzers PQM-702 / 702T / 703 / 710 / 711 are able to record values of instantaneous voltages and currents of 3 periods of the base signal preceding the end of the averaging period. It is possible to attach to PQDif files the selected signals of voltages and currents in chosen phases if they have been previously selected to be recorded by the analyzer. In the absence of waveforms or any of the signals, these fields are not available for selection.

3.4.4　Events (area 4)

This area is editable, if there are events with waveforms and $RMS_{1/2}$ waveforms.

Events are grouped into types, while the conversion is always simultaneously applied to the both types of waveforms: free waveforms (f_p ~10.24 kHz) and $RMS_{1/2}$ waveforms. In the case of transients, the conversion is applied by default to free waveforms (f_p ~10,24 kHz) of voltages and currents, as well as fast waveforms of voltages with the recorded sampling rate.

3.4.5　Trends (area 5)

This area allows user to select specific groups of parameters, which will be also included in the conversion to PQDif file.

> Harmonics and interharmonics represent a very large amount of data and have a significant impact on extending the conversion time. Processing of the parameters may be accelerated by selecting the icon of the entire column or entire row.

If the recorded parameters include data on TDD, then the final stage of downloading measurements includes the preliminary analysis of fundamental harmonic of current in all phases and the **area 6** is pre-filled with the determined maximum value The user can use the proposed current parameter or enter own value to be used in converting percentage values of TDD during the conversion to a PQDif file.

3.4.6　Conversion to file

After selecting the desired options and filling all the relevant information fields, simply press **Conversion** button and then - in the window for saving the file - change (or not) the proposed name of the file, which will include the conversion result. Completion of the conversion is confirmed by the additional information window.

Then, the program returns to the main dialogue box, to allow another conversion after selecting a new set of parameters. Closing the main window for parameter selection will result in displaying the start window and the user will be able to indicate another data source for conversion.

3.4.7　Saving default settings

If **Set as default** field is active during the conversion, then the program will remember the contents of all additional information and selected active signals for the conversion from the areas of: trends, events and periodic waveforms.

4　Operation in console mode (batch)

The basis of this operation method is the ability to load and execute commands as input parameters of the program. This provides automatic conversion by the mechanism, which uses scripts prepared by other programs or manually by the user.

> To operate the converter from the command line, it is also necessary to be a license holder. To confirm this, start the graphic interface of Sonel PQDif Converter and enter a valid license key.

4.1 Command Line API version: 1.10

Displaying help **Help**

Displaying version information **Version**

Data Source (required):
- from an analysis file (*.analysis* extension)
- from a data file (*.pqm7xx* extension)
- from the analyzer via USB

--fromAnalysis <file_path>
--fromData <file_path>
--fromAnalyzer <serial_number> --pin <pin>

Point number (required
for **--fromData** and **--fromAnalyzer**)

--point <point_number>
Number of punt in the range of <1,4>

Time range (optional).
When not specified, data from the entire range are taken for the conversion.

--timeRange <start>-<end>
Time format: yyyyMMddHHmmss

Data type (required)

--aggregationData <data_type>
Permitted data types:
- **user** - user data
- **standard** - data from the standard

Types of values for trends (required when **--eventsTypes** and
--oscillogramsTypes are not selected)

--trendsTypes <type>[,<type>…]
Permitted types are listed in Table 1.
For example:
- for voltages: **--trendsTypes U**
- for voltages, currents and PF: **--trendsTypes U,I,PF**

Types of wires for trends (required for **--trendsTypes**)

--trendsWires <wire>[,<wire>…]
Permitted wire types are listed in Table 2.

Types of values for the waveforms at the end of the averaging period (required when **--trendsTypes** and **--eventsTypes** are not selected)

--oscillogramsTypes <type>[,<type>…]
Permitted types:
- **U** - SA15::MeasureType_Voltage
- **I** - SA15::MeasureType_Current

For example:
- for voltages: **--oscillogramsTypes U**
- for voltages and currents: **--oscillogramsTypes U,I**

Wire types for waveforms at the end of the averaging period (required for **--oscillogramsTypes**)

--oscillogramsWires <wire>[,<wire>…]

Permitted wire types are listed in Table 2.

Types of values for events (required when **--trendsTypes** and **--oscillogramsTypes** are not selected)	**----eventsTypes \<type>[,\<type>…]** Permitted types:

  - **UDip** - dips
  - **USwe** - swells
  - **UInt** - interruptions
  - **Trans** - transients
  - **RVC** - Rapid Voltage Changes
  - **Wave** - changes in the shape of the envelope
  - **Jump** - phase jumps
  - **I** - current

  For example:
  - for dips: **--typesEvents UDip**
  - for swells and currents: **--typesEvents USwe,I**

Wire types for events (required for **--eventsTypes**)	**--eventsWires \<wire>[,\<wire>…]** Permitted wire types are listed in Tab. 2.

The output file name (required):
- saving to a single file
- saving to separate files

--out \<file_path>
--outTrends \<file_path>
--outEvents \<file_path>
--outOscillograms \<file_path>

User information (optional):
- name
- title
- subject
- author
- keywords
- comment
- notes

--name \<name>
--title \<title>
--subject \<subject>
--author \<author>
--keywords \<keywords>
--comments \<comments>
--notes \<notes>

Exporting statistics from data trends   **--exportStatistics**

Examples of commands:

for .pqm7xx file:
> "*\<program path>***SonelPQDifConverterCLI.exe**" --fromData "Sample data EN 50160.pqm702" --point 1 --timeRange 20130416144044-20130424121614 --aggregationData standard --out "out.pqd" --trendsTypes U --trendsWires L1

for .analysis file:
> "*\<program path>***SonelPQDifConverterCLI.exe**" –from "Analysis Sample data EN 50160.analysis" --aggregationData standard --out out.pqd --trendsTypes F_10s,U,Uu-,Uu0,Uthd,Uh,Uplt,P_15min,Ep+ --trendsWires L1,L2,L3,N

5   Summing 4Q types

In order to maintain the compatibility of Q4 data with basic PQDif types, the option summing the values has been added:
- o   **EqC-_4Q** and **EqL-_4Q** to **Eq-** and
- o   **EqC+_4Q** and **EqL+_4Q** to **Eq+**.

To execute the summing-up, provide 3 types from a given group. If you provide only 2 types, Q4 summing-up will not be executed.

Tab. 1. Permitted value types for trends (--trendsTypes)

Value type for trends	Type: SA15
Ang	SA15::MeasureType_AngleBetweenHarmonics
Ep-	SA15::MeasureType_Energy_PNegative
Ep-_15m	SA15::MeasureType_Energy_PNegative_15min
Ep+	SA15::MeasureType_Energy_PPositive
Ep+_15m	SA15::MeasureType_Energy_PPositive_15min
Eq-	SA15::MeasureType_Energy_QNegative
Eq-_IEEE	SA15::MeasureType_Energy_QNegative_IEEE1459
Eq+	SA15::MeasureType_Energy_QPositive
Eq+_IEEE	SA15::MeasureType_Energy_QPositive_IEEE1459
EqC-_4Q	SA15::MeasureType_Energy_QCNegative_4Q
EqC-_4Q_15min	SA15::MeasureType_Energy_QCNegative_4Q_15min
EqC+_4Q	SA15::MeasureType_Energy_QCPositive_4Q
EqC+_4Q_15min	SA15::MeasureType_Energy_QCPositive_4Q_15min
EqL-_4Q	SA15::MeasureType_Energy_QLNegative_4Q
EqL-_4Q_15min	SA15::MeasureType_Energy_QLNegative_4Q_15min
EqL+_4Q	SA15::MeasureType_Energy_QLPositive_4Q
EqL+_4Q_15min	SA15::MeasureType_Energy_QLPositive_4Q_15min
Es	SA15::MeasureType_Energy_S
Es_4Q	SA15::MeasureType_Energy_Es_4Q
F	SA15::MeasureType_Voltage_Frequency
F_10s	SA15::MeasureType_Voltage_Frequency_10sec
I	SA15::MeasureType_Current
Iang	SA15::MeasureType_Current_Angle
Icf	SA15::MeasureType_Current_CrestFactor
Idc	SA15::MeasureType_Current_DC
Ih	SA15::MeasureType_Current_Harmonics
Ii	SA15::MeasureType_Current_Interharmonics
Ikf	SA15::MeasureType_Current_KFactor
Isc-	SA15::MeasureType_Current_SequenceComponentNegative
Isc+	SA15::MeasureType_Current_SequenceComponentPositive
Isc0	SA15::MeasureType_Current_SequenceComponentZero

Value type for trends	Type: SA15
Ithd	SA15::MeasureType_Current_THD
Itid	SA15::MeasureType_Current_TID
Iu-	SA15::MeasureType_Current_UnbalanceNegative
Iu0	SA15::MeasureType_Current_UnbalanceZero
P	SA15::MeasureType_Power_P
P_15m	SA15::MeasureType_Power_P_15min
P_4Q	SA15::MeasureType_Power_P_4Q
Pd_B	SA15::MeasureType_Power_D_Budeanu
Pd_IEEE	SA15::MeasureType_Power_D_IEEE1459
Pd_SN	SA15::MeasureType_Power_D_SN
Pdpf	SA15::MeasureType_Power_DPF
Pdpf_4Q	SA15::MeasureType_Power_DPF_4Q
Pf	SA15::MeasureType_Power_PF
Pf_4Q	SA15::MeasureType_Power_PF_4Q
Pph	SA15::MeasureType_Power_PHarmonics
Pq_15m	SA15::MeasureType_Power_Q_15min
Pq_4Q	SA15::MeasureType_Power_Q_4Q
Pq_B	SA15::MeasureType_Power_Q_Budeanu
Pq_IEEE	SA15::MeasureType_Power_Q_IEEE1459
Pqh	SA15::MeasureType_Power_QHarmonics
Ps	SA15::MeasureType_Power_S
Ps_15m	SA15::MeasureType_Power_S_15min
Ps_4Q	SA15::MeasureType_Power_S_4Q
Ptg	SA15::MeasureType_Power_tgPhi
Ptg_15m	SA15::MeasureType_Power_tgPhi_15min
PtgC-_4Q	SA15::MeasureType_Power_tgCNegative_4Q
PtgC-_4Q_10min	SA15::MeasureType_Power_tgCNegative_4Q_10min
PtgC-_4Q_15min	SA15::MeasureType_Power_tgCNegative_4Q_15min
PtgC+_4Q	SA15::MeasureType_Power_tgCPositive_4Q
PtgC+_4Q_10min	SA15::MeasureType_Power_tgCPositive_4Q_10min
PtgC+_4Q_15min	SA15::MeasureType_Power_tgCPositive_4Q_15min
PtgL-_4Q	SA15::MeasureType_Power_tgLNegative_4Q
PtgL-_4Q_10min	SA15::MeasureType_Power_tgLNegative_4Q_10min
PtgL-_4Q_15min	SA15::MeasureType_Power_tgLNegative_4Q_15min
PtgL+_4Q	SA15::MeasureType_Power_tgLPositive_4Q
PtgL+_4Q_10min	SA15::MeasureType_Power_tgLPositive_4Q_10min
PtgL+_4Q_15min	SA15::MeasureType_Power_tgLPositive_4Q_15min
RVC	SA15::MeasureType_RVC
T	SA15::MeasureType_Temperature
U	SA15::MeasureType_Voltage
Uang	SA15::MeasureType_Voltage_Angle

Value type for trends	Type: SA15
Ucf	SA15::MeasureType_Voltage_CrestFactor
Udc	SA15::MeasureType_Voltage_DC
Uh	SA15::MeasureType_Voltage_Harmonics
Ui	SA15::MeasureType_Voltage_Interharmonics
Up2p	SA15::MeasureType_Voltage_PhaseToPhase
Uplt	SA15::MeasureType_Voltage_Plt
Upp	SA15::MeasureType_Voltage_Polyphase
Upst	SA15::MeasureType_Voltage_Pst
Ur1	SA15::MeasureType_Voltage_UR1
Ur1_3s	SA15::MeasureType_Voltage_UR1_3sec
Ur2	SA15::MeasureType_Voltage_UR2
Ur2_3s	SA15::MeasureType_Voltage_UR2_3sec
Usc-	SA15::MeasureType_Voltage_SequenceComponentNegative
Usc+	SA15::MeasureType_Voltage_SequenceComponentPositive
Usc0	SA15::MeasureType_Voltage_SequenceComponentZero
Uthd	SA15::MeasureType_Voltage_THD
Utid	SA15::MeasureType_Voltage_TID
Utr	SA15::MeasureType_Voltage_Transient
Uu-	SA15::MeasureType_Voltage_UnbalanceNegative
Uu0	SA15::MeasureType_Voltage_UnbalanceZero

Tab. 2. Permitted wire types

Wire type	Type: SA15
L1	SA15::Wire_L1
L2	SA15::Wire_L2
L3	SA15::Wire_L3
N	SA15::Wire_N oraz (Total), Σ śred, Σ chwil

6 Conversion specification and assignment in PQDif

Column **Group**:

 Std. - standard scope, the parameter is always converted

 Ext. - extended scope, the parameter is converted after selecting **Additional parameters** option

To ensure the clarity of documentation, specification of harmonics is limited to the first and last line of the group of parameters, separated by a line containing "...".

The parameters in the network of 1-phase and 2-phase types have names and numbering resulting from the number of phases; moreover, they do not have parameters describing the asymmetry.

Tab. 3. Specification of converting measurements according to the Standard for Delta (D) networks

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	f10s L12 inst S [Hz]	f 10s L12 Trend	10 s	ID_QC_FREQUENCY
Std. + Ext.	U L12 avg S [V]	U L12 Trend	10 min	ID_QC_RMS
Std. + Ext.	U L23 avg S [V]	U L23 Trend	10 min	ID_QC_RMS
Std. + Ext.	U L31 avg S [V]	U L31 Trend	10 min	ID_QC_RMS
Std. + Ext.	Pst L12 inst S [---]	Pst L12 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Pst L23 inst S [---]	Pst L23 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Pst L31 inst S [---]	Pst L31 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Plt L12 inst S [---]	Plt L12 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	Plt L23 inst S [---]	Plt L23 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	Plt L31 inst S [---]	Plt L31 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	U0/U1 Σ avg S [%]	U0/U1 Total Trend	10 min	ID_QC_S0S1
Std. + Ext.	U2/U1 Σ avg S [%]	U2/U1 Total Trend	10 min	ID_QC_S2S1
Std. + Ext.	U0 Σ avg S [V]	U0 Total Trend	10 min	ID_QC_SZERO
Std. + Ext.	U1 Σ avg S [V]	U1 Total Trend	10 min	ID_QC_SPOS
Std. + Ext.	U2 Σ avg S [V]	U2 Total Trend	10 min	ID_QC_SNEG
Std. + Ext.	THD U L12 avg S [%]	THD U L12 Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	THD U L23 avg S [%]	THD U L23 Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	THD U L31 avg S [%]	THD U L31 Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	U H 1 L12 avg S [V]	U H(1) L12 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	….	….	….	….
Std. + Ext.	U H 50 L12 avg S [V]	U H(50) L12 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	U H 1 L23 avg S [V]	U H(1) L23 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	….	….	….	….
Std. + Ext.	U H 50 L23 avg S [V]	U H(50) L23 Trend	10 min	ID_QC_SPECTRA_HGROUP

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	U H 1 L31 avg S [V]	U H(1) L31 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	….	….	….	….
Std. + Ext.	U H 50 L31 avg S [V]	U H(50) L31 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	P15min Σ avg S [W]	P 15min Total Trend	15 min	ID_QC_P
Std. + Ext.	Q115min Σ avg S [var]	Q1 15min Total Trend	15 min	ID_QC_Q_FUND
Std. + Ext.	QB15min Σ avg S [var]	QB 15min Total Trend	15 min	ID_QC_Q
Std. + Ext.	S15min Σ avg S [VA]	S 15min Total Trend	15 min	ID_QC_S
Std. + Ext.	EP+ 15min Σ inst S [Wh]	EP+ 15min Total Trend	15 min	ID_QC_P_INTG_POS
Std. + Ext.	EP- 15min Σ inst S [Wh]	EP- 15min Total Trend	15 min	ID_QC_P_INTG_NEG
Std. + Ext.	calculated: (EQ1L+ 15min Σ inst S) - (EQ1C+ 15min Σ inst S)	EQ1+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS_FUND
Std. + Ext.	(EQ1C- 15min Σ inst S) - (EQ1L- 15min Σ inst S)	EQ1- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Std. + Ext.	calculated: (EQBL+ 15min Σ inst S) - (EQBC+ 15min Σ inst S)	EQB+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS
Std. + Ext.	(EQBC- 15min Σ inst S) - (EQBL- 15min Σ inst S)	EQB- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQ1L+ 15min Σ inst S [varh]	EQ1L+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1C- 15min Σ inst S [varh]	EQ1C- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1L- 15min Σ inst S [varh]	EQ1L- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1C+ 15min Σ inst S [varh]	EQ1C+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQBL+ 15min Σ inst S [varh]	EQBL+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBC- 15min Σ inst S [varh]	EQBC- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBL- 15min Σ inst S [varh]	EQBL- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBC+ 15min Σ inst S [varh]	EQBC+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS
Ext.	tg(φ)L+15min Σ avg S [---]	tan(phi)L+ 15min Total Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C-15min Σ avg S [---]	tan(phi)C- 15min Total Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L-15min Σ avg S [---]	tan(phi)L- 15min Total Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C+15min Σ avg S [---]	tan(phi)C+ 15min Total Trend	15 min	ID_QC_NONE
	tg(φ)L+ Σ avg S [---]	-	-	-
	tg(φ)C- Σ avg S [---]	-	-	-
	tg(φ)L- Σ avg S [---]	-	-	-
	tg(φ)C+ Σ avg S [---]	-	-	-

Table 4. Specification of converting measurements according to the Standard for Star (YN) networks

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	f10s L1 inst S [Hz]	f 10s) L1 Trend	10 s	ID_QC_FREQUENCY
Std. + Ext.	U L1 avg S [V]	U) L1 Trend	10 min	ID_QC_RMS
Std. + Ext.	U L2 avg S [V]	U) L2 Trend	10 min	ID_QC_RMS
Std. + Ext.	U L3 avg S [V]	U) L3 Trend	10 min	ID_QC_RMS
Std. + Ext.	U N-PE avg S [V]	U) N-PE Trend	10 min	ID_QC_RMS
Std. + Ext.	U L12 avg S [V]	U) L12 Trend	10 min	ID_QC_RMS
Std. + Ext.	U L23 avg S [V]	U) L23 Trend	10 min	ID_QC_RMS
Std. + Ext.	U L31 avg S [V]	U) L31 Trend	10 min	ID_QC_RMS
Std. + Ext.	Pst L1 inst S [---]	Pst) L1 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Pst L2 inst S [---]	Pst) L2 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Pst L3 inst S [---]	Pst) L3 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Plt L1 inst S [---]	Plt) L1 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	Plt L2 inst S [---]	Plt) L2 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	Plt L3 inst S [---]	Plt) L3 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	U0/U1 Σ avg S [%]	U0/U1 Total Trend	10 min	ID_QC_S0S1
Std. + Ext.	U2/U1 Σ avg S [%]	U2/U1 Total Trend	10 min	ID_QC_S2S1
Std. + Ext.	U0 Σ avg S [V]	U0 Total Trend	10 min	ID_QC_SZERO
Std. + Ext.	U1 Σ avg S [V]	U1 Total Trend	10 min	ID_QC_SPOS
Std. + Ext.	U2 Σ avg S [V]	U2 Total Trend	10 min	ID_QC_SNEG
Std. + Ext.	THD U L1 avg S [%]	THD U) L1 Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	THD U L2 avg S [%]	THD U) L2 Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	THD U L3 avg S [%]	THD U) L3 Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	THD U N-PE avg S [%]	THD U) N-PE Trend	10 min	ID_QC_TOTAL_THD
Std. + Ext.	U H 1 L1 avg S [V]	U H(1) L1 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.				
Std. + Ext.	U H 50 L1 avg S [V]	U H(50) L1 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	U H 1 L2 avg S [V]	U H(1) L2 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.				
Std. + Ext.	U H 50 L2 avg S [V]	U H(50) L2 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	U H 1 L3 avg S [V]	U H(1) L3 Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.				
Std. + Ext.	U H 50 L3 avg S [V]	U H(50) L3 Trend	10 min	ID_QC_SPECTRA_HGROUP

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	U H 1 N-PE avg S [V]	U H(1) N-PE Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.				
Std. + Ext.	U H 50 N-PE avg S [V]	U H(50) N-PE Trend	10 min	ID_QC_SPECTRA_HGROUP
Std. + Ext.	P15min L1 avg S [W]	P 15min L1 Trend	15 min	ID_QC_P
Std. + Ext.	P15min L2 avg S [W]	P 15min L2 Trend	15 min	ID_QC_P
Std. + Ext.	P15min L3 avg S [W]	P 15min L3 Trend	15 min	ID_QC_P
Std. + Ext.	P15min Σ avg S [W]	P 15min Total Trend	15 min	ID_QC_P
Std. + Ext.	Q1 15min l1 avg S [var]	Q1 15min L1 Trend	15 min	ID_QC_Q_FUND
Std. + Ext.	Q1 15min L2 avg S [var]	Q1 15min L2 Trend	15 min	ID_QC_Q_FUND
Std. + Ext.	Q1 15min L3 avg S [var]	Q1 15min L3 Trend	15 min	ID_QC_Q_FUND
Std. + Ext.	Q1 15min Σ avg S [var]	Q1 15min Total Trend	15 min	ID_QC_Q_FUND
Std. + Ext.	QB 15min l1 avg S [var]	QB 15min L1 Trend	15 min	ID_QC_Q
Std. + Ext.	QB 15min L2 avg S [var]	QB 15min L2 Trend	15 min	ID_QC_Q
Std. + Ext.	QB 15min L3 avg S [var]	QB 15min L3 Trend	15 min	ID_QC_Q
Std. + Ext.	QB 15min Σ avg S [var]	QB 15min Total Trend	15 min	ID_QC_Q
Std. + Ext.	S15min L1 avg S [VA]	S 15min L1 Trend	15 min	ID_QC_S
Std. + Ext.	S15min L2 avg S [VA]	S 15min L2 Trend	15 min	ID_QC_S
Std. + Ext.	S15min L3 avg S [VA]	S 15min L3 Trend	15 min	ID_QC_S
Std. + Ext.	S15min Σ avg S [VA]	S 15min Total Trend	15 min	ID_QC_S
Std. + Ext.	EP+ 15min L1 inst S [Wh]	EP+ 15min L1 Trend	15 min	ID_QC_P_INTG_POS
Std. + Ext.	EP+ 15min L2 inst S [Wh]	EP+ 15min L2 Trend	15 min	ID_QC_P_INTG_POS
Std. + Ext.	EP+ 15min L3 inst S [Wh]	EP+ 15min L3 Trend	15 min	ID_QC_P_INTG_POS
Std. + Ext.	EP+ 15min Σ inst S [Wh]	EP+ 15min Total Trend	15 min	ID_QC_P_INTG_POS
Std. + Ext.	EP- 15min L1 inst S [Wh]	EP- 15min L1 Trend	15 min	ID_QC_P_INTG_NEG
Std. + Ext.	EP- 15min L2 inst S [Wh]	EP- 15min L2 Trend	15 min	ID_QC_P_INTG_NEG
Std. + Ext.	EP- 15min L3 inst S [Wh]	EP- 15min L3 Trend	15 min	ID_QC_P_INTG_NEG
Std. + Ext.	EP- 15min Σ inst S [Wh]	EP- 15min Total Trend	15 min	ID_QC_P_INTG_NEG
Std. + Ext.	calculated: (EQ1L+ 15min L1 inst S) - (EQ1C+ 15min L1 inst S)	EQ1+ 15min L1 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Std. + Ext.	(EQ1L+ 15min L2 inst S) - (EQ1C+ 15min L2 inst S)	EQ1+ 15min L2 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Std. + Ext.	(EQ1L+ 15min L3 inst S) - (EQ1C+ 15min L3 inst S)	EQ1+ 15min L3 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Std. + Ext.	(EQ1L+ 15min Σ inst S) - (EQ1C+ 15min Σ inst S)	EQ1+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS_FUND
Std. + Ext.	calculated: (EQ1L- 15min L1 inst S) - (EQ1C- 15min L1 inst S)	EQ1- 15min L1 Trend	15 min	ID_QC_Q_INTG_NEG_FUND

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	(EQ1L- 15min L2 inst S) - (EQ1C- 15min L2 inst S)	EQ1- 15min L2 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Std. + Ext.	(EQ1L- 15min L3 inst S) - (EQ1C- 15min L3 inst S)	EQ1- 15min L3 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Std. + Ext.	(EQ1L- 15min Σ inst S) - (EQ1C- 15min Σ inst S)	EQ1- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Std. + Ext.	**calculated:** (EQBL+ 15min L1 inst S) - (EQBC+ 15min L1 inst S)	EQB+ 15min L1 Trend	15 min	ID_QC_Q_INTG_POS
Std. + Ext.	(EQBL+ 15min L2 inst S) - (EQBC+ 15min L2 inst S)	EQB+ 15min L2 Trend	15 min	ID_QC_Q_INTG_POS
Std. + Ext.	(EQBL+ 15min L3 inst S) - (EQBC+ 15min L3 inst S)	EQB+ 15min L3 Trend	15 min	ID_QC_Q_INTG_POS
Std. + Ext.	(EQBL+ 15min Σ inst S) - (EQBC+ 15min Σ inst S)	EQB+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS
Std. + Ext.	**calculated:** (EQBL- 15min L1 inst S) - (EQBC- 15min L1 inst S)	EQB- 15min L1 Trend	15 min	ID_QC_Q_INTG_NEG
Std. + Ext.	(EQBL- 15min L2 inst S) - (EQBC- 15min L2 inst S)	EQB- 15min L2 Trend	15 min	ID_QC_Q_INTG_NEG
Std. + Ext.	(EQBL- 15min L3 inst S) - (EQBC- 15min L3 inst S)	EQB- 15min L3 Trend	15 min	ID_QC_Q_INTG_NEG
Std. + Ext.	(EQBL- 15min Σ inst S) - (EQBC- 15min Σ inst S)	EQB- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQ1L+ 15min L1 inst S [varh]	EQ1L+ 15min L1 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1L+ 15min L2 inst S [varh]	EQ1L+ 15min L2 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1L+ 15min L3 inst S [varh]	EQ1L+ 15min L3 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1L+ 15min Σ inst S [varh]	EQ1L+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1C- 15min L1 inst S [varh]	EQ1C- 15min L1 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1C- 15min L2 inst S [varh]	EQ1C- 15min L2 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1C- 15min L3 inst S [varh]	EQ1C- 15min L3 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1C- 15min Σ inst S [varh]	EQ1C- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1L- 15min L1 inst S [varh]	EQ1L- 15min L1 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1L- 15min L2 inst S [varh]	EQ1L- 15min L2 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1L- 15min L3 inst S [varh]	EQ1L- 15min L3 Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1L- 15min Σ inst S [varh]	EQ1L- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1C+ 15min L1 inst S [varh]	EQ1C+ 15min L1 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1C+ 15min L2 inst S [varh]	EQ1C+ 15min L2 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1C+ 15min L3 inst S [varh]	EQ1C+ 15min L3 Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1C+ 15min Σ inst S [varh]	EQ1C+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS_FUND
Ext.	EQBL+ 15min L1 inst S [varh]	EQBL+ 15min L1 Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBL+ 15min L2 inst S [varh]	EQBL+ 15min L2 Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBL+ 15min L3 inst S [varh]	EQBL+ 15min L3 Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBL+ 15min Σ inst S [varh]	EQBL+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBC- 15min L1 inst S [varh]	EQBC- 15min L1 Trend	15 min	ID_QC_Q_INTG_NEG

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Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Ext.	EQBC- 15min L2 inst S [varh]	EQBC- 15min L2 Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBC- 15min L3 inst S [varh]	EQBC- 15min L3 Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBC- 15min Σ inst S [varh]	EQBC- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBL- 15min L1 inst S [varh]	EQBL- 15min L1 Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBL- 15min L2 inst S [varh]	EQBL- 15min L2 Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBL- 15min L3 inst S [varh]	EQBL- 15min L3 Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBL- 15min Σ inst S [varh]	EQBL- 15min Total Trend	15 min	ID_QC_Q_INTG_NEG
Ext.	EQBC+ 15min L1 inst S [varh]	EQBC+ 15min L1 Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBC+ 15min L2 inst S [varh]	EQBC+ 15min L2 Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBC+ 15min L3 inst S [varh]	EQBC+ 15min L3 Trend	15 min	ID_QC_Q_INTG_POS
Ext.	EQBC+ 15min Σ inst S [varh]	EQBC+ 15min Total Trend	15 min	ID_QC_Q_INTG_POS
Ext.	tg(φ)L+15min L1 avg S [---]	tan(phi)L+ 15min L1 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L+15min L2 avg S [---]	tan(phi)L+ 15min L2 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L+15min L3 avg S [---]	tan(phi)L+ 15min L3 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L+15min Σ avg S [---]	tan(phi)L+ 15min Total Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C-15min L1 avg S [---]	tan(phi)C- 15min L1 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C-15min L2 avg S [---]	tan(phi)C- 15min L2 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C-15min L3 avg S [---]	tan(phi)C- 15min L3 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C-15min Σ avg S [---]	tan(phi)C- 15min Total Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L-15min L1 avg S [---]	tan(phi)L- 15min L1 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L-15min L2 avg S [---]	tan(phi)L- 15min L2 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L-15min L3 avg S [---]	tan(phi)L- 15min L3 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)L-15min Σ avg S [---]	tan(phi)L- 15min Total Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C+15min L1 avg S [---]	tan(phi)C+ 15min L1 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C+15min L2 avg S [---]	tan(phi)C+ 15min L2 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C+15min L3 avg S [---]	tan(phi)C+ 15min L3 Trend	15 min	ID_QC_NONE
Ext.	tg(φ)C+15min Σ avg S [---]	tan(phi)C+ 15min Total Trend	15 min	ID_QC_NONE
	tg(φ)L+ L1 avg S [---]	-	-	-
	tg(φ)L+ L2 avg S [---]	-	-	-
	tg(φ)L+ L3 avg S [---]	-	-	-
	tg(φ)L+ Σ avg S [---]	-	-	-
	tg(φ)C- L1 avg S [---]	-	-	-
	tg(φ)C- L2 avg S [---]	-	-	-

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
	tg(φ)C- L3 avg S [---]	-	-	-
	tg(φ)C- Σ avg S [---]	-	-	-
	tg(φ)L- L1 avg S [---]	-	-	-
	tg(φ)L- L2 avg S [---]	-	-	-
	tg(φ)L- L3 avg S [---]	-	-	-
	tg(φ)L- Σ avg S [---]	-	-	-
	tg(φ)C+ L1 avg S [---]	-	-	-
	tg(φ)C+ L2 avg S [---]	-	-	-
	tg(φ)C+ L3 avg S [---]	-	-	-
	tg(φ)C+ Σ avg S [---]	-	-	-

Table 5. Specification of converting measurements according to the User for Delta (D) networks

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	f L12 avg [Hz]	f L12 Trend	U_avg	ID_QC_FREQUENCY
Std. + Ext.	U L12 avg [V]	U L12 Trend	U_avg	ID_QC_RMS
Std. + Ext.	U L23 avg [V]	U L23 Trend	U_avg	ID_QC_RMS
Std. + Ext.	U L31 avg [V]	U L31 Trend	U_avg	ID_QC_RMS
Std. + Ext.	U DC L12 avg [V]	U DC L12 Trend	U_avg	ID_QC_NONE
Std. + Ext.	U DC L23 avg [V]	U DC L23 Trend	U_avg	ID_QC_NONE
Std. + Ext.	U DC L31 avg [V]	U DC L31 Trend	U_avg	ID_QC_NONE
Std. + Ext.	I L1 avg [A]	I L1 Trend	U_avg	ID_QC_RMS
Std. + Ext.	I L2 avg [A]	I L2 Trend	U_avg	ID_QC_RMS
Std. + Ext.	I L3 avg [A]	I L3 Trend	U_avg	ID_QC_RMS
Std. + Ext.	Pst L12 inst [---]	Pst L12 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Pst L23 inst [---]	Pst L23 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Pst L31 inst [---]	Pst L31 Trend	10 min	ID_QC_FLKR_PST
Std. + Ext.	Plt L12 inst [---]	Plt L12 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	Plt L23 inst [---]	Plt L23 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	Plt L31 inst [---]	Plt L31 Trend	2 h	ID_QC_FLKR_PLT
Std. + Ext.	U0/U1 Σ avg [%]	U0/U1 Total Trend	U_avg	ID_QC_S0S1
Std. + Ext.	U2/U1 Σ avg [%]	U2/U1 Total Trend	U_avg	ID_QC_S2S1
Std. + Ext.	U0 Σ avg [V]	U0 Total Trend	U_avg	ID_QC_SZERO

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	U1 Σ avg [V]	U1 Total Trend	U_avg	ID_QC_SPOS
Std. + Ext.	U2 Σ avg [V]	U2 Total Trend	U_avg	ID_QC_SNEG
Std. + Ext.	I0/I1 Σ avg [%]	I0/I1 Total Trend	U_avg	ID_QC_S0S1
Std. + Ext.	I2/I1 Σ avg [%]	I2/I1 Total Trend	U_avg	ID_QC_S2S1
Std. + Ext.	I0 Σ avg [A]	I0 Total Trend	U_avg	ID_QC_SZERO
Std. + Ext.	I1 Σ avg [A]	I1 Total Trend	U_avg	ID_QC_SPOS
Std. + Ext.	I2 Σ avg [A]	I2 Total Trend	U_avg	ID_QC_SNEG
Std. + Ext.	CF U L12 avg [---]	CF U L12 Trend	U_avg	ID_QC_CREST_FACTOR
Std. + Ext.	CF U L23 avg [---]	CF U L23 Trend	U_avg	ID_QC_CREST_FACTOR
Std. + Ext.	CF U L31 avg [---]	CF U L31 Trend	U_avg	ID_QC_CREST_FACTOR
Std. + Ext.	CF I L1 avg [---]	CF I L1 Trend	U_avg	ID_QC_CREST_FACTOR
Std. + Ext.	CF I L2 avg [---]	CF I L2 Trend	U_avg	ID_QC_CREST_FACTOR
Std. + Ext.	CF I L3 avg [---]	CF I L3 Trend	U_avg	ID_QC_CREST_FACTOR
Std. + Ext.	THD U L12 avg [%]	THD U L12 Trend	U_avg	ID_QC_TOTAL_THD
Std. + Ext.	THD U L23 avg [%]	THD U L23 Trend	U_avg	ID_QC_TOTAL_THD
Std. + Ext.	THD U L31 avg [%]	THD U L31 Trend	U_avg	ID_QC_TOTAL_THD
Std. + Ext.	THD I L1 avg [%]	THD I L1 Trend	U_avg	ID_QC_TOTAL_THD
Std. + Ext.	THD I L2 avg [%]	THD I L2 Trend	U_avg	ID_QC_TOTAL_THD
Std. + Ext.	THD I L3 avg [%]	THD I L3 Trend	U_avg	ID_QC_TOTAL_THD
Std. + Ext.	TID U L12 avg [%]	TID U L12 Trend	U_avg	ID_QC_TID
Std. + Ext.	TID U L23 avg [%]	TID U L23 Trend	U_avg	ID_QC_TID
Std. + Ext.	TID U L31 avg [%]	TID U L31 Trend	U_avg	ID_QC_TID
Std. + Ext.	TID I L1 avg [%]	TID I L1 Trend	U_avg	ID_QC_TID
Std. + Ext.	TID I L2 avg [%]	TID I L2 Trend	U_avg	ID_QC_TID
Std. + Ext.	TID I L3 avg [%]	TID I L3 Trend	U_avg	ID_QC_TID
Std. + Ext.	TDD L1 avg [%]	TDD L1 Trend	U_avg	ID_QC_TDD
Std. + Ext.	TDD L2 avg [%]	TDD L2 Trend	U_avg	ID_QC_TDD
Std. + Ext.	TDD L3 avg [%]	TDD L3 Trend	U_avg	ID_QC_TDD
Std. + Ext.	K L1 avg [---]	K L1 Trend	U_avg	ID_QC_K_FACTOR
Std. + Ext.	K L2 avg [---]	K L2 Trend	U_avg	ID_QC_K_FACTOR
Std. + Ext.	K L3 avg [---]	K L3 Trend	U_avg	ID_QC_K_FACTOR
Std. + Ext.	PF Σ avg [---]	PF Total Trend	U_avg	ID_QC_PF
Std. + Ext.	P Σ avg [W]	P Total Trend	U_avg	ID_QC_P

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	Q1 Σ avg [var]	Q1 Total Trend	U_avg	ID_QC_Q_FUND
Ext.	Sn Σ avg [VA]	Sn Total Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
Std. + Ext.	QB Σ avg [var]	QB Total Trend	U_avg	ID_QC_Q
Ext.	D Σ avg [var]	D Total Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
Std. + Ext.	S Σ avg [VA]	S Total Trend	U_avg	ID_QC_S
Std. + Ext.	EP+ Σ inst [Wh]	EP+ Total Trend	U_avg	ID_QC_P_INTG_POS
Std. + Ext.	EP- Σ inst [Wh]	EP- Total Trend	U_avg	ID_QC_P_INTG_NEG
Std. + Ext.	**calculated:** (EQ1L+ Σ inst) - (EQ1C+ Σ inst)	EQ1+ Total Trend	U_avg	ID_QC_Q_INTG_POS_FUND
Std. + Ext.	**calculated:** (EQ1C- Σ inst) - (EQ1L- Σ inst)	EQ1- Total Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
Std. + Ext.	**calculated:** (EQBL+ Σ inst) - (EQBC+ Σ inst)	EQB+ Total Trend	U_avg	ID_QC_Q_INTG_POS
Std. + Ext.	**calculated:** (EQBC- Σ inst) - (EQBL- Σ inst)	EQB- Total Trend	U_avg	ID_QC_Q_INTG_NEG
Std. + Ext.	ES Σ inst [VAh]	ES Total Trend	U_avg	ID_QC_S_INTG
Ext.	EQ1L+ Σ inst [varh]	EQ1L+ Total Trend	U_avg	ID_QC_Q_INTG_POS_FUND
Ext.	EQ1C- Σ inst [varh]	EQ1C- Total Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1L- Σ inst [varh]	EQ1L- Total Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
Ext.	EQ1C+ Σ inst [varh]	EQ1C+ Total Trend	U_avg	ID_QC_Q_INTG_POS_FUND
Ext.	EQBL+ Σ inst [varh]	EQBL+ Total Trend	U_avg	ID_QC_Q_INTG_POS
Ext.	EQBC- Σ inst [varh]	EQBC- Total Trend	U_avg	ID_QC_Q_INTG_NEG
Ext.	EQBL- Σ inst [varh]	EQBL- Total Trend	U_avg	ID_QC_Q_INTG_NEG
Ext.	EQBC+ Σ inst [varh]	EQBC+ Total Trend	U_avg	ID_QC_Q_INTG_POS
Ext.	tg(φ)L+ Σ avg [---]	tan(phi)L+ Total Trend	U_avg	ID_QC_NONE
Ext.	tg(φ)C- Σ avg [---]	tan(phi)C- Total Trend	U_avg	ID_QC_NONE
Ext.	tg(φ)L- Σ avg [---]	tan(phi)L- Total Trend	U_avg	ID_QC_NONE
Ext.	tg(φ)C+ Σ avg [---]	tan(phi)C+ Total Trend	U_avg	ID_QC_NONE
Std. + Ext.	U H 1 L12 avg [V]	U H(1) L12 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	…..			
Std. + Ext.	U H 50 L12 avg [V]	U H(50) L12 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	U H 1 L23 avg [V]	U H(1) L23 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	…..			
Std. + Ext.	U H 50 L23 avg [V]	U H(50) L23 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	U H 1 L31 avg [V]	U H(1) L31 Trend	U_avg	ID_QC_SPECTRA_HGROUP

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
Std. + Ext.	…..			
Std. + Ext.	U H 50 L31 avg [V]	U H(50) L31 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	I H 1 L1 avg [A]	I H(1) L1 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	…..			
Std. + Ext.	I H 50 L1 avg [A]	I H(50) L1 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	I H 1 L2 avg [A]	I H(1) L2 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	…..			
Std. + Ext.	I H 50 L2 avg [A]	I H(50) L2 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	I H 1 L3 avg [A]	I H(1) L3 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	…..			
Std. + Ext.	I H 50 L3 avg [A]	I H(50) L3 Trend	U_avg	ID_QC_SPECTRA_HGROUP
Std. + Ext.	U IH 0 L12 avg [V]	U IH(0) L12 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	…..			
Std. + Ext.	U IH 50 L12 avg [V]	U IH(50) L12 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	U IH 0 L23 avg [V]	U IH(0) L23 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	…..			
Std. + Ext.	U IH 50 L23 avg [V]	U IH(50) L23 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	U IH 0 L31 avg [V]	U IH(0) L31 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	…..			
Std. + Ext.	U IH 50 L31 avg [V]	U IH(50) L31 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	I IH 0 L1 avg [A]	I IH(0) L1 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	…..			
Std. + Ext.	I IH 50 L1 avg [A]	I IH(50) L1 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	I IH 0 L2 avg [A]	I IH(0) L2 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	…..			
Std. + Ext.	I IH 50 L2 avg [A]	I IH(50) L2 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	I IH 0 L3 avg [A]	I IH(0) L3 Trend	U_avg	ID_QC_SPECTRA_IGROUP
Std. + Ext.	…..			
Std. + Ext.	I IH 50 L3 avg [A]	I IH(50) L3 Trend	U_avg	ID_QC_SPECTRA_IGROUP

Table 6. Specification of converting measurements according to the User for Star (YN) networks

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Std. + Ext.	f L1 avg [Hz]	f L1 Trend	U_avg	ID_QC_FREQUENCY
YN_U: Std. + Ext.	U L1 avg [V]	U L1 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U L2 avg [V]	U L2 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U L3 avg [V]	U L3 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U N-PE avg [V]	U N-PE Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U L12 avg [V]	U L12 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U L23 avg [V]	U L23 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U L31 avg [V]	U L31 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	U DC L1 avg [V]	U DC L1 Trend	U_avg	ID_QC_NONE
YN_U: Std. + Ext.	U DC L2 avg [V]	U DC L2 Trend	U_avg	ID_QC_NONE
YN_U: Std. + Ext.	U DC L3 avg [V]	U DC L3 Trend	U_avg	ID_QC_NONE
YN_U: Std. + Ext.	U DC N-PE avg [V]	U DC N-PE Trend	U_avg	ID_QC_NONE
YN_U: Std. + Ext.	Pst L1 inst [---]	Pst L1 Trend	10 min	ID_QC_FLKR_PST
YN_U: Std. + Ext.	Pst L2 inst [---]	Pst L2 Trend	10 min	ID_QC_FLKR_PST
YN_U: Std. + Ext.	Pst L3 inst [---]	Pst L3 Trend	10 min	ID_QC_FLKR_PST
YN_U: Std. + Ext.	Plt L1 inst [---]	Plt L1 Trend	2 h	ID_QC_FLKR_PLT
YN_U: Std. + Ext.	Plt L2 inst [---]	Plt L2 Trend	2 h	ID_QC_FLKR_PLT
YN_U: Std. + Ext.	Plt L3 inst [---]	Plt L3 Trend	2 h	ID_QC_FLKR_PLT
YN_U: Std. + Ext.	U0/U1 Σ avg [%]	U0/U1 Total Trend	U_avg	ID_QC_S0S1
YN_U: Std. + Ext.	U2/U1 Σ avg [%]	U2/U1 Total Trend	U_avg	ID_QC_S2S1
YN_U: Std. + Ext.	U0 Σ avg [V]	U0 Total Trend	U_avg	ID_QC_SZERO
YN_U: Std. + Ext.	U1 Σ avg [V]	U1 Total Trend	U_avg	ID_QC_SPOS
YN_U: Std. + Ext.	U2 Σ avg [V]	U2 Total Trend	U_avg	ID_QC_SNEG
YN_U: Std. + Ext.	I L1 avg [A]	I L1 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	I L2 avg [A]	I L2 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	I L3 avg [A]	I L3 Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	I N avg [A]	I N Trend	U_avg	ID_QC_RMS
YN_U: Std. + Ext.	I0/I1 Σ avg [%]	I0/I1 Total Trend	U_avg	ID_QC_S0S1
YN_U: Std. + Ext.	I2/I1 Σ avg [%]	I2/I1 Total Trend	U_avg	ID_QC_S2S1
YN_U: Std. + Ext.	I0 Σ avg [A]	I0 Total Trend	U_avg	ID_QC_SZERO
YN_U: Std. + Ext.	I1 Σ avg [A]	I1 Total Trend	U_avg	ID_QC_SPOS
YN_U: Std. + Ext.	I2 Σ avg [A]	I2 Total Trend	U_avg	ID_QC_SNEG

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Std. + Ext.	CF U L1 avg [---]	CF U L1 Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF U L2 avg [---]	CF U L2 Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF U L3 avg [---]	CF U L3 Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF U N-PE avg [---]	CF U N-PE Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF I L1 avg [---]	CF I L1 Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF I L2 avg [---]	CF I L2 Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF I L3 avg [---]	CF I L3 Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	CF I N avg [---]	CF I N Trend	U_avg	ID_QC_CREST_FACTOR
YN_U: Std. + Ext.	THD U L1 avg [%]	THD U L1 Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD U L2 avg [%]	THD U L2 Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD U L3 avg [%]	THD U L3 Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD U N-PE avg [%]	THD U N-PE Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD I L1 avg [%]	THD I L1 Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD I L2 avg [%]	THD I L2 Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD I L3 avg [%]	THD I L3 Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	THD I N avg [%]	THD I N Trend	U_avg	ID_QC_TOTAL_THD
YN_U: Std. + Ext.	TID U L1 avg [%]	TID U L1 Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID U L2 avg [%]	TID U L2 Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID U L3 avg [%]	TID U L3 Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID U N-PE avg [%]	TID U N-PE Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID I L1 avg [%]	TID I L1 Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID I L2 avg [%]	TID I L2 Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID I L3 avg [%]	TID I L3 Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TID I N avg [%]	TID I N Trend	U_avg	ID_QC_TID
YN_U: Std. + Ext.	TDD L1 avg [%]	TDD L1 Trend	U_avg	ID_QC_TDD
YN_U: Std. + Ext.	TDD L2 avg [%]	TDD L2 Trend	U_avg	ID_QC_TDD
YN_U: Std. + Ext.	TDD L3 avg [%]	TDD L3 Trend	U_avg	ID_QC_TDD
YN_U: Std. + Ext.	TDD N avg [%]	TDD N Trend	U_avg	ID_QC_TDD
YN_U: Std. + Ext.	K L1 avg [---]	K L1 Trend	U_avg	ID_QC_K_FACTOR
YN_U: Std. + Ext.	K L2 avg [---]	K L2 Trend	U_avg	ID_QC_K_FACTOR
YN_U: Std. + Ext.	K L3 avg [---]	K L3 Trend	U_avg	ID_QC_K_FACTOR
YN_U: Std. + Ext.	K N avg [---]	K N Trend	U_avg	ID_QC_K_FACTOR
YN_U: Std. + Ext.	PF L1 avg [---]	PF L1 Trend	U_avg	ID_QC_PF

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Std. + Ext.	PF L2 avg [---]	PF L2 Trend	U_avg	ID_QC_PF
YN_U: Std. + Ext.	PF L3 avg [---]	PF L3 Trend	U_avg	ID_QC_PF
YN_U: Std. + Ext.	PF Σ avg [---]	PF Total Trend	U_avg	ID_QC_PF
YN_U: Std. + Ext.	cos(φ) L1 avg [---]	cos(phi) L1 Trend	U_avg	ID_QC_DF
YN_U: Std. + Ext.	cos(φ) L2 avg [---]	cos(phi) L2 Trend	U_avg	ID_QC_DF
YN_U: Std. + Ext.	cos(φ) L3 avg [---]	cos(phi) L3 Trend	U_avg	ID_QC_DF
YN_U: Std. + Ext.	cos(φ) Σ avg [---]	cos(phi) Total Trend	U_avg	ID_QC_DF
YN_U: Std. + Ext.	P L1 avg [W]	P L1 Trend	U_avg	ID_QC_P
YN_U: Std. + Ext.	P L2 avg [W]	P L2 Trend	U_avg	ID_QC_P
YN_U: Std. + Ext.	P L3 avg [W]	P L3 Trend	U_avg	ID_QC_P
YN_U: Std. + Ext.	P Σ avg [W]	P Total Trend	U_avg	ID_QC_P
YN_U: Std. + Ext.	S L1 avg [VA]	S L1 Trend	U_avg	ID_QC_S
YN_U: Std. + Ext.	S L2 avg [VA]	S L2 Trend	U_avg	ID_QC_S
YN_U: Std. + Ext.	S L3 avg [VA]	S L3 Trend	U_avg	ID_QC_S
YN_U: Std. + Ext.	S Σ avg [VA]	S Total Trend	U_avg	ID_QC_S
YN_U: Std. + Ext.	Q1 L1 avg [var]	Q1 L1 Trend	U_avg	ID_QC_Q_FUND
YN_U: Std. + Ext.	Q1 L2 avg [var]	Q1 L2 Trend	U_avg	ID_QC_Q_FUND
YN_U: Std. + Ext.	Q1 L3 avg [var]	Q1 L3 Trend	U_avg	ID_QC_Q_FUND
YN_U: Std. + Ext.	Q1 Σ avg [var]	Q1 Total Trend	U_avg	ID_QC_Q_FUND
YN_U: Ext.	Sn L1 avg [VA]	Sn L1 Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Ext.	Sn L2 avg [VA]	Sn L2 Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Ext.	Sn L3 avg [VA]	Sn L3 Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Ext.	Sn Σ avg [VA]	Sn Total Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Std. + Ext.	QB L1 avg [var]	QB L1 Trend	U_avg	ID_QC_Q
YN_U: Std. + Ext.	QB L2 avg [var]	QB L2 Trend	U_avg	ID_QC_Q
YN_U: Std. + Ext.	QB L3 avg [var]	QB L3 Trend	U_avg	ID_QC_Q
YN_U: Std. + Ext.	QB Σ avg [var]	QB Total Trend	U_avg	ID_QC_Q
YN_U: Ext.	D L1 avg [var]	D L1 Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Ext.	D L2 avg [var]	D L2 Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Ext.	D L3 avg [var]	D L3 Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Ext.	D Σ avg [var]	D Total Trend	U_avg	{1E3EC348-716E-4D27-BFF2-63DC56B6F678}
YN_U: Std. + Ext.	EP+ L1 inst [Wh]	EP+ L1 Trend	U_avg	ID_QC_P_INTG_POS
YN_U: Std. + Ext.	EP+ L2 inst [Wh]	EP+ L2 Trend	U_avg	ID_QC_P_INTG_POS

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Std. + Ext.	EP+ L3 inst [Wh]	EP+ L3 Trend	U_avg	ID_QC_P_INTG_POS
YN_U: Std. + Ext.	EP+ Σ inst [Wh]	EP+ Total Trend	U_avg	ID_QC_P_INTG_POS
YN_U: Std. + Ext.	EP- L1 inst [Wh]	EP- L1 Trend	U_avg	ID_QC_P_INTG_NEG
YN_U: Std. + Ext.	EP- L2 inst [Wh]	EP- L2 Trend	U_avg	ID_QC_P_INTG_NEG
YN_U: Std. + Ext.	EP- L3 inst [Wh]	EP- L3 Trend	U_avg	ID_QC_P_INTG_NEG
YN_U: Std. + Ext.	EP- Σ inst [Wh]	EP- Total Trend	U_avg	ID_QC_P_INTG_NEG
YN_U: Std. + Ext.	ES L1 inst [VAh]	ES L1 Trend	U_avg	ID_QC_S_INTG
YN_U: Std. + Ext.	ES L2 inst [VAh]	ES L2 Trend	U_avg	ID_QC_S_INTG
YN_U: Std. + Ext.	ES L3 inst [VAh]	ES L3 Trend	U_avg	ID_QC_S_INTG
YN_U: Std. + Ext.	ES Σ inst [VAh]	ES Total Trend	U_avg	ID_QC_S_INTG
YN_U: Std. + Ext.	**calculated:** (EQ1L+L1 inst) - (EQ1C+L1 inst)	EQ1+ L1 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Std. + Ext.	(EQ1L+L2 inst) - (EQ1C+L2 inst)	EQ1+ L2 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Std. + Ext.	(EQ1L+L3 inst) - (EQ1C+L3 inst)	EQ1+ L3 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Std. + Ext.	(EQ1L+Σ inst) - (EQ1C+Σ inst)	EQ1+ Total Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Std. + Ext.	**calculated:** (EQ1C-L1 inst) - (EQ1L-L1 inst)	EQ1- L1 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Std. + Ext.	(EQ1C-L2 inst) - (EQ1L-L2 inst)	EQ1- L2 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Std. + Ext.	(EQ1C-L3 inst) - (EQ1L-L3 inst)	EQ1- L3 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Std. + Ext.	(EQ1C-Σ inst) - (EQ1L-Σ inst)	EQ1- Total Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Std. + Ext.	**calculated:** (EQBL+L1 inst) - (EQBC+L1 inst)	EQB+ L1 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Std. + Ext.	(EQBL+L2 inst) - (EQBC+L2 inst)	EQB+ L2 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Std. + Ext.	(EQBL+L3 inst) - (EQBC+L3 inst)	EQB+ L3 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Std. + Ext.	(EQBL+Σ inst) - (EQBC+Σ inst)	EQB+ Total Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Std. + Ext.	**calculated:** (EQBC-L1 inst) - (EQBL-L1 inst)	EQB- L1 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Std. + Ext.	(EQBC-L2 inst) - (EQBL-L2 inst)	EQB- L2 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Std. + Ext.	(EQBC-L3 inst) - (EQBL-L3 inst)	EQB- L3 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Std. + Ext.	(EQBC-Σ inst) - (EQBL-Σ inst)	EQB- Total Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQ1L+ L1 inst [varh]	EQ1L+ L1 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1L+ L2 inst [varh]	EQ1L+ L2 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1L+ L3 inst [varh]	EQ1L+ L3 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1L+ Σ inst [varh]	EQ1L+ Total Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1C- L1 inst [varh]	EQ1C- L1 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Ext.	EQ1C- L2 inst [varh]	EQ1C- L2 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1C- L3 inst [varh]	EQ1C- L3 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1C- Σ inst [varh]	EQ1C- Total Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1L- L1 inst [varh]	EQ1L- L1 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1L- L2 inst [varh]	EQ1L- L2 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1L- L3 inst [varh]	EQ1L- L3 Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1L- Σ inst [varh]	EQ1L- Total Trend	U_avg	ID_QC_Q_INTG_NEG_FUND
YN_U: Ext.	EQ1C+ L1 inst [varh]	EQ1C+ L1 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1C+ L2 inst [varh]	EQ1C+ L2 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1C+ L3 inst [varh]	EQ1C+ L3 Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQ1C+ Σ inst [varh]	EQ1C+ Total Trend	U_avg	ID_QC_Q_INTG_POS_FUND
YN_U: Ext.	EQBL+ L1 inst [varh]	EQBL+ L1 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBL+ L2 inst [varh]	EQBL+ L2 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBL+ L3 inst [varh]	EQBL+ L3 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBL+ Σ inst [varh]	EQBL+ Total Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBC- L1 inst [varh]	EQBC- L1 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBC- L2 inst [varh]	EQBC- L2 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBC- L3 inst [varh]	EQBC- L3 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBC- Σ inst [varh]	EQBC- Total Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBL- L1 inst [varh]	EQBL- L1 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBL- L2 inst [varh]	EQBL- L2 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBL- L3 inst [varh]	EQBL- L3 Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBL- Σ inst [varh]	EQBL- Total Trend	U_avg	ID_QC_Q_INTG_NEG
YN_U: Ext.	EQBC+ L1 inst [varh]	EQBC+ L1 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBC+ L2 inst [varh]	EQBC+ L2 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBC+ L3 inst [varh]	EQBC+ L3 Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	EQBC+ Σ inst [varh]	EQBC+ Total Trend	U_avg	ID_QC_Q_INTG_POS
YN_U: Ext.	tg(φ)L+ L1 avg [---]	tan(phi)L+ L1 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L+ L2 avg [---]	tan(phi)L+ L2 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L+ L3 avg [---]	tan(phi)L+ L3 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L+ Σ avg [---]	tan(phi)L+ Total Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C- L1 avg [---]	tan(phi)C- L1 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C- L2 avg [---]	tan(phi)C- L2 Trend	U_avg	ID_QC_NONE

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Ext.	tg(φ)C- L3 avg [---]	tan(phi)C- L3 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C- Σ avg [---]	tan(phi)C- Total Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L- L1 avg [---]	tan(phi)L- L1 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L- L2 avg [---]	tan(phi)L- L2 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L- L3 avg [---]	tan(phi)L- L3 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)L- Σ avg [---]	tan(phi)L- Total Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C+ L1 avg [---]	tan(phi)C+ L1 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C+ L2 avg [---]	tan(phi)C+ L2 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C+ L3 avg [---]	tan(phi)C+ L3 Trend	U_avg	ID_QC_NONE
YN_U: Ext.	tg(φ)C+ Σ avg [---]	tan(phi)C+ Total Trend	U_avg	ID_QC_NONE
YN_U: Std. + Ext.	U H 1 L1 avg [V]	U H(1) L1 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 50 L1 avg [V]	U H(50) L1 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 1 L2 avg [V]	U H(1) L2 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 50 L2 avg [V]	U H(50) L2 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 1 L3 avg [V]	U H(1) L3 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 50 L3 avg [V]	U H(50) L3 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 1 N-PE avg [V]	U H(1) N-PE Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	U H 50 N-PE avg [V]	U H(50) N-PE Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 1 L1 avg [A]	I H(1) L1 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 50 L1 avg [A]	I H(50) L1 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 1 L2 avg [A]	I H(1) L2 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 50 L2 avg [A]	I H(50) L2 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 1 L3 avg [A]	I H(1) L3 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 50 L3 avg [A]	I H(50) L3 Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	I H 1 N avg [A]	I H(1) N Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_HGROUP

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Std. + Ext.	I H 50 N avg [A]	I H(50) N Trend	U_avg	ID_QC_SPECTRA_HGROUP
YN_U: Std. + Ext.	φ H 1 L1 avg [°]	phi H(1) L1 Trend	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	φ H 50 L1 avg [°]	phi H(50) L1 Trend	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	φ H 1 L2 avg [°]	phi H(1) L2 Trend	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	φ H 50 L2 avg [°]	phi H(50) L2 Trend	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	φ H 1 L3 avg [°]	phi H(1) L3 Trend	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	φ H 50 L3 avg [°]	phi H(50) L3 Trend	U_avg	ID_QC_ANGLE_FUND
YN_U: Std. + Ext.	P H 1 L1 avg [W]	P H(1) L1 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	P H 50 L1 avg [W]	P H(50) L1 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	P H 1 L2 avg [W]	P H(1) L2 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	P H 50 L2 avg [W]	P H(50) L2 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	P H 1 L3 avg [W]	P H(1) L3 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	P H 50 L3 avg [W]	P H(50) L3 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	Q H 1 L1 avg [var]	Q H(1) L1 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	Q H 50 L1 avg [var]	Q H(50) L1 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	Q H 1 L2 avg [var]	Q H(1) L2 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	Q H 50 L2 avg [var]	Q H(50) L2 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	Q H 1 L3 avg [var]	Q H(1) L3 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	Q H 50 L3 avg [var]	Q H(50) L3 Trend	U_avg	ID_QC_SPECTRA
YN_U: Std. + Ext.	U IH 0 L1 avg [V]	U IH(0) L1 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	U IH 50 L1 avg [V]	U IH(50) L1 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	U IH 0 L2 avg [V]	U IH(0) L2 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP

Group	Name in PQM and SA	Name PQDif def.	Interval	ID
YN_U: Std. + Ext.	U IH 50 L2 avg [V]	U IH(50) L2 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	U IH 0 L3 avg [V]	U IH(0) L3 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	U IH 50 L3 avg [V]	U IH(50) L3 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	U IH 0 N-PE avg [V]	U IH(0) N-PE Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	U IH 50 N-PE avg [V]	U IH(50) N-PE Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 0 L1 avg [A]	I IH(0) L1 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 50 L1 avg [A]	I IH(50) L1 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 0 L2 avg [A]	I IH(0) L2 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 50 L2 avg [A]	I IH(50) L2 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 0 L3 avg [A]	I IH(0) L3 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 50 L3 avg [A]	I IH(50) L3 Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 0 N avg [A]	I IH(0) N Trend	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	…..	…..	U_avg	ID_QC_SPECTRA_IGROUP
YN_U: Std. + Ext.	I IH 50 N avg [A]	I IH(50) N Trend	U_avg	ID_QC_SPECTRA_IGROUP