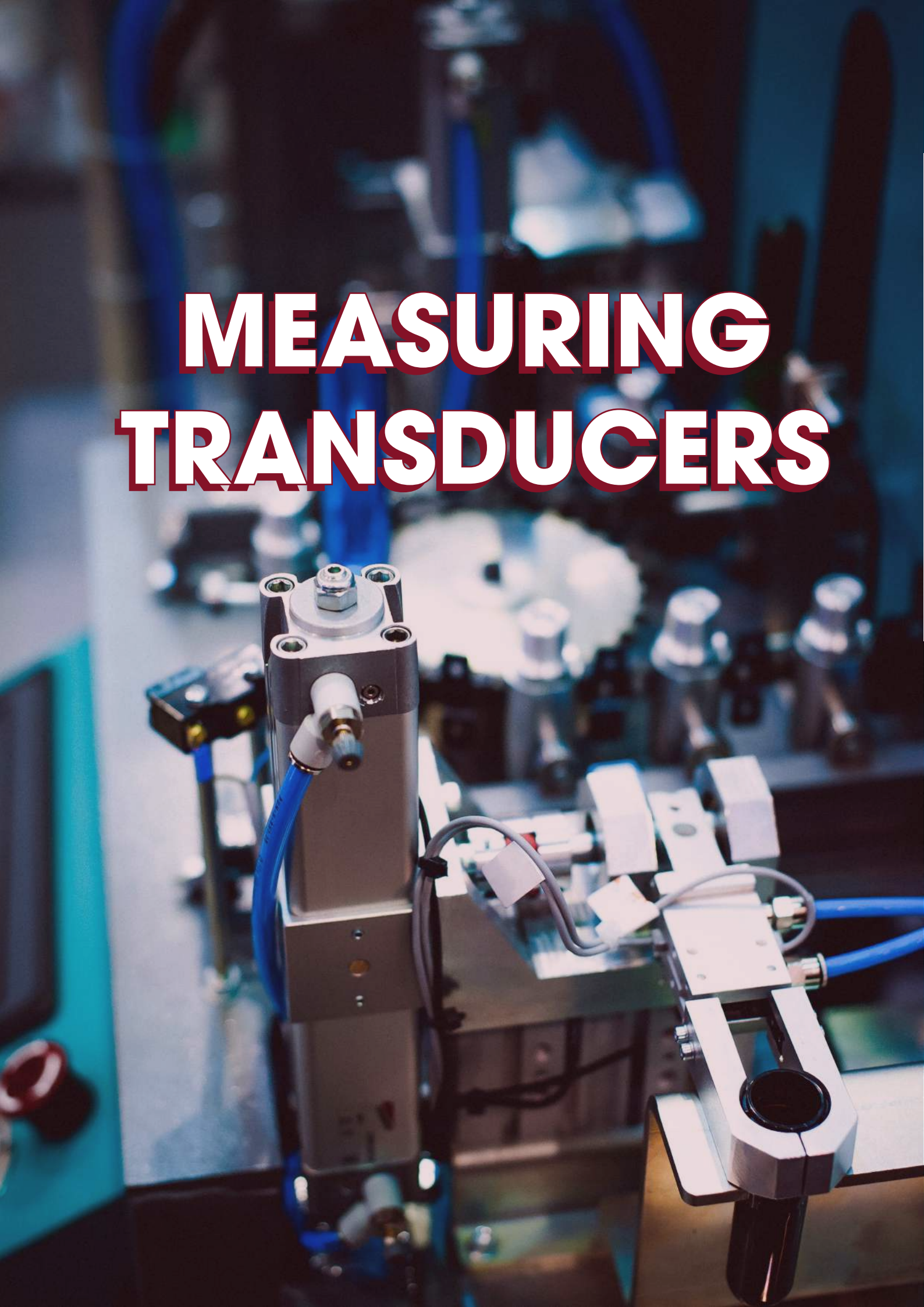
MEASURING
TRANSDUCERS

MEASURING TRANSDUCERS

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General features

Measuring transducers

General technical specifications

• Isolation	3,7 kV, 50Hz, 1min Double insulation Category III Pollution degree 2
• Electrical impulse test	5 kV, 1,2/50 µs
• High Frequency Interference (HF)	2,5 kV, 1 MHz
• Reference temperature	23°C ±1 °C
• Temperature Coefficient	≤ 0,01% / °C
• Operating temperature	- 10 °C a + 55 °C
• Storage temperature	- 30 °C a + 70 °C
• Linearity error	≤ 0,1 %
• Ripple (Peak to Peak)	≤ 0,3 %
• Response time	≤ 200 ms (0 - 90 %Io)
• Operating frequency	50, 60 y 400 Hz
• Overloads	***Current input*** 2 In permanent 20 In, 3s 40 In, 1s 30In, 3s (on request) 60In, 1s (on request)
	Voltage input 1,2 Vn permament 2 Vn, 10s

Standard

- IEC 60688
- IEC 60068
- IEC 61326
- IEC 61010
- IEC 60529
- EN 60688
- EN 60069
- EN 61326
- EN 61010
- EN 60529

Inputs*

Tipo 1 (Alternating current)	**In**	**1 A - 5 A**
	Burden (per circuit)	0,2 VA
		1,5 VA (self supplied)
Tipo 2 (Alternating voltage)	**Vn**	**57,7..63,5 - 100..110 - 220..230 - 380..400 - 400 V**
	Burden (per circuit)	(Vn 1 mA) VA
		1,5 VA (self supplied)
Tipo 3 (Direct current)	**In**	**100 µA ÷ 5 A**
	Burden (per circuit)	In 60 mV
Tipo 4 (Direct voltage)	**Vn**	**60 mV ÷ 440 V**
	Burden (per circuit)	Vn 1 mA
Tipo 5 (Frequency)	**Fn**	**50 - 60 - 400 Hz**

Outputs*

Type 1 (Current output)	**Io**	**1 - 5 - 10 - 20 mA**
	Load resistance	Ro (kΩ) = 12 V / Io (mA)
	Saturation limit	2 Io
Type 2 (Current output)	**Io (auxiliary voltage required)**	**4 - 20 mA**
	Load resistance	Ro (kΩ) = 12 V / Io (mA)
	Saturation limit	2 Io
Type 3 (Voltage output)	**Vo (auxiliary voltage required)**	**1 - 5 - 10 V** **1..5 - 2..10 V**
	Load resistance	Ro (kΩ) = 10 V / Vo (mA)
	Saturation limit	2 Vo
	Max. open circuit output voltage	30 V
Type 4	**Pulse output**	**CP_'s only**
	Voltage	250 Vac, 30 Vdc
	Type	Relay
	Maximum current	10 A
Type 5	**Communication**	**USB and RS 485**

Auxiliary voltage*

Type 1	AC Auxiliary voltage	115 - 230 - 400 V ± 20%
Type 2	DC Auxiliary voltage	12 - 24 - 48 - 110 - 220 V ± 20 %
Type 3	Models ATIP - ATUP - CP40	Universal 40..275 V CA/CC

Generic specifications. Please, check particular characteristics of each model.
*Other technical specifications, on request.

Measuring transducers

1° Input

Input [1]	No.	Type
AC current	1	1 or 5 A (.../1 or .../5 A)
AC voltage	2	100, 110, 115, 230, 400 or 440 V
DC current	3	100 µA - 5 A
DC voltage	4	60 mV - 440 V

2° Output

Output [2]	No.	Type
DC current	1	1, 5, 10 or 20 mA
DC current	2	4 - 20 mA
Voltage	3	1 - 5 -10 or 1 - 5 or 2 - 10 V

3° Auxiliary voltages

Auxiliary voltages [3]	No.	Type
V. Aux. AC	1	115, 230, 400 ± 20% V AC
V. Aux. DC	2	12, 24, 48, 110 or 220 ± 20% V DC

ATI_

	AC current	Range	Input[1]	Output[2]	Aux. V.[3]	Models
A	Single-phase	0,5 - 1,2 In	1	1	-	ATI
A	Triple, single-phase	0,5 - 1,2 In	1	1	-	ATI3
A	Single-phase	0 - 1,2 In	1	1	-	ATIz
A	Triple, single-phase	0 - 1,2 In	1	1	-	ATIz3
A	Single-phase	0 - 1,2 In	1	1 - 2 - 3	1 - 2	ATIa
A	Triple, single-phase	0 - 1,2 In	1	1 - 2 - 3	1 - 2	ATIa3
A	Bidirectional, single-phase	± 1,2 In	1 - 2	1 - 2 - 3	1 - 2	ATIB
A	Bidirectional, three-phase balanced	± 1,2 In	1 - 2	1 - 2 - 3	1	ATIBI

Other accuracy values on request. Unaffected by frequency variation

ATIca

	DC current	Range	Input[1]	Output[2]	Aux. V.[3]	Models
A	Single-phase	± 0 - 1,2 In	3	1 - 2 - 3	1 - 2	ATIca
A	Single-phase	± 0 - 1,2 In	3	1 - 2 - 3	2	ATIca-a

Other accuracy values on request.

ATU_

	AC voltage	Range	Input[1]	Output[2]	Aux. V.[3]	Models
V	Single-phase	0,4 - 1,2 Un	2	1	-	ATU
V	Triple, single-phase	0,4 - 1,2 Un	2	1	-	ATU3
V	Single-phase	0 - 1,2 Un	2	1 - 2 - 3	1 - 2	ATUa
V	Triple, single-phase	0 - 1,2 Un	2	1 - 2 - 3	1 - 2	ATUa3

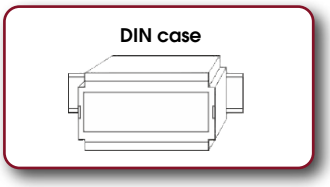
Other accuracy values on request. Unaffected by frequency variation

ATUca

	DC voltage	Range	Input[1]	Output[2]	Aux. V.[3]	Models
V	Single-phase	± 0 - 1,2 Un	4	1 - 2 - 3	1 - 2	ATUca
V	Single-phase	± 0 - 1,2 Un	4	1 - 2 - 3	2	ATUca-a

Other accuracy values on request.

Measuring transducers



ATW_

Active power		Range	Input[1]	Output[2]	Aux. V.[3]	Model
P	Single-phase	0 - 1,2 Pn or ± 1,2 Pn	1 - 2	1 - 2 - 3	1 - 2	ATW
P	Balanced three-phase (3 wire)	0 - 1,2 Pn or ± 1,2 Pn	1 - 2	1 - 2 - 3	1 - 2	ATWI
P	Balanced three-phase (4 wire)	0 - 1,2 Pn or ± 1,2 Pn	1 - 2	1 - 2 - 3	1 - 2	ATWIn
P	Unbalanced three-phase (3 wire)	0 - 1,2 Pn or ± 1,2 Pn	1 - 2	1 - 2 - 3	1 - 2	ATWII
P	Unbalanced three-phase (4 wire)	0 - 1,2 Pn or ± 1,2 Pn	1 - 2	1 - 2 - 3	1 - 2	ATW3

Other accuracy values on request. Not measurable variation with frequency.

ATWr_

Reactive power		Range	Input[1]	Output[2]	Aux. V.[3]	Model
Q	Single-phase	0 - 1,2 Qn or ± 1,2 Qn	1 - 2	1 - 2 - 3	1 - 2	ATWr
Q	Balanced three-phase (3 wire)	0 - 1,2 Qn or ± 1,2 Qn	1 - 2	1 - 2 - 3	1 - 2	ATWIr
Q	Balanced three-phase (4 wire)	0 - 1,2 Qn or ± 1,2 Qn	1 - 2	1 - 2 - 3	1 - 2	ATWInr
Q	Unbalanced three-phase (3 wire)	0 - 1,2 Qn or ± 1,2 Qn	1 - 2	1 - 2 - 3	1 - 2	ATWIIr
Q	Unbalanced three-phase (4 wire)	0 - 1,2 Qn or ± 1,2 Qn	1 - 2	1 - 2 - 3	1 - 2	ATW3r

Other accuracy values on request. Variation with frequency < 0.1 % / Hz.

ATWV_

Active + reactive power		Range	Input[1]	Output[2]	Aux. V.[3]	Model
P+Q	Single-phase	0 - 1,2 Pn+Qn or ± 1,2 Pn+Qn	1 - 2	1 - 2 - 3	1 - 2	ATWV
P+Q	Balanced three-phase (3 wire)	0 - 1,2 Pn+Qn or ± 1,2 Pn+Qn	1 - 2	1 - 2 - 3	1 - 2	ATWVI
P+Q	Balanced three-phase (4 wire)	0 - 1,2 Pn+Qn or ± 1,2 Pn+Qn	1 - 2	1 - 2 - 3	1 - 2	ATWVIn
P+Q	Unbalanced three-phase (3 wire)	0 - 1,2 Pn+Qn or ± 1,2 Pn+Qn	1 - 2	1 - 2 - 3	1 - 2	ATWVII
P+Q	Unbalanced three-phase (4 wire)	0 - 1,2 Pn+Qn or ± 1,2 Pn+Qn	1 - 2	1 - 2 - 3	1	ATWV3

Other accuracy values on request. Negligible frequency variation in active power, for reactive power < 0.1 % / Hz.

ATF_

Frequency		Range	Input[1]	Output[2]	Aux. V.[3]	Model
HZ	50 Hz, 60 Hz or 400 Hz	0,9 - 1,1 Fn	2	1 - 2 - 3	-	ATF
HZ	50 Hz, 60 Hz or 400 Hz	0,9 - 1,1 Fn	2	1 - 2 - 3	1 - 2	ATFa

Other precision values on request.

ATA_

Phase angle		Range	Input[1]	Output[2]	Aux. V.[3]	Model
A	Single-phase	-60° - 0 - 60°	1 - 2	1 - 2 - 3	1 - 2	ATA
A	Balanced three-phase	-90° - 0 - 90°	1 - 2	1 - 2 - 3	1 - 2	ATAI
A	Single-phase (between voltages)	-180° - 0 - 180°	2	1 - 2 - 3	1	ATAU

Other accuracy values on request. Variation with frequency not measurable.

Measuring transducers

Resistance and temperature

General features

	Input resistance	Range	Output[2]	Aux. V.[3]	Model
R	0 - 100; 0 - 3000 Ohm	0 - 100 %	1 - 2 - 3	1 - 2	ATS2

Other accuracy values on request

	Input temperature	Range	Output[2]	Aux. V.[3]	Model
°C	Pt-100 / Pt-1000 Probe (0 -100; 0-600 °C)	0 - 100 %	1 - 2 - 3	1 - 2	ATS1

Other accuracy values on request

ATS1P, ATS2P programmable transducers

Resistance and temperature

General features

Resistance and temperature converters with RMS measurement (true RMS measurement of current or voltage), microprocessor-controlled and configurable via software.

They feature USB and RS485 serial ports with Modbus RTU protocol.

Measurement parameters	ATS2P	ATS1P
Resistance	•	
Temperature		•
Range	0 - 100 %	0 - 100 %

Input features	Range
ATS2	0 - 100; 0 - 3000 Ohm
ATS1	Pt-100 / PT-1000 Probe (0 -100; 0-600 °C)

Other accuracy values on request

Output features	Range
DC current	1, 5, 10, 20 mA 4 - 20 mA
DC voltage	1 - 5 -10; 1 - 5; 2 - 10 V
Communication	USB y RS485

Auxiliar voltage	Range
Universal	40 - 275 V AC/DC

ATIP, ATUP programmable transducers

Alternating current

General features

Microprocessor-controlled, software-conFigureble RMS (true RMS measurement of current or voltage) converter.

It has an USB and RS485 serial port with Modbus/RTU protocol.

Measurement parameters	ATIP	ATUP
RSM current	•	
RSM voltage		•
Range	0 - 1,2 In	0 - 1,2 Vn

Input features	Range
ATIP	X/5 and X/1 A
ATUP	110 and 230 V

Output features	Range
DC current	0 - 5 or 4 - 20 mA
DC voltage	0 - 10 V
Communication	USB and RS485

Auxiliar voltage	Range
Universal	40 - 275 V AC/DC
Direct current (DC)	12, 24, 48 V DC

ATIcaP, ATUcaP programmable transducers

Direct current

General features

DC current converter with RMS measurement (true RMS measurement of current or voltage), microprocessor-controlled and configurable via software.

It features USB and RS485 serial ports with Modbus RTU protocol.

Measurement parameters	ATIcaP	ATUcaP
Current (RMS)	•	
Voltage (RMS)		•
Range	± 0 - 1,2 In	± 0 - 1,2 Vn

Input features	Range
ATIcaP	60mV
ATUcaP	0 - 100V / 0 - 600V

Output features	Range
DC current	0 - 5 or 4 - 20 mA
DC voltage	0 - 10 V
Communication	USB and RS485

Auxiliary voltage	Range
Universal	40 - 275 V AC/DC

CP40 programmable measuring transducers

CP42, CP43, CP44

Measurement parameters	CP42	CP43	CP44
Line and phase voltage (RMS)	•	•	•
Current (RMS)	•	•	•
Total and phase active power	•	•	•
Total and phase cosine of ϕ	•	•	•
Total and phase reactive power	•	•	•
Total and phase apparent power	•	•	•
Frequency	•	•	•

General features	CP42	CP43	CP44
Positive active energy	Digital output		
Inductive and capacitive reactive power	Digital output		
Analog outputs	2	3	4
Pulse / contacts / alarms outputs	2	2	2
Programmable	•	•	•
Analysis / management software	•	•	•

Input features	Range
Rated voltage	110 or 400V
Rated current	X/1 A and X/5 A
Universal auxiliary power supply	40 - 275 V DC/AC
DC auxiliary power	18 - 72 V DC
Frequency	50 or 60 Hz

Output features	Range
Current	0 - 1; 0 - 5; 0 - 10; 0 - 20 or 4 - 20 mA
Voltage	0 - 1; 0 - 5; 0 - 10; 1 - 5 or 2 - 10 V
Serial port	RS 485 and USB

Auxiliary voltage	Range
Universal	40 - 275 V AC/DC

Type	Models	Models	Models
Single-phase	CP42-0	CP43-0	CP44-0
3-phase, 3 wires, balanced	CP42-1	CP43-1	CP44-1
3-phase, 4 wires, balanced	CP42-1A	CP43-1A	CP44-1A
3-phase, 3 wires, unbalanced	CP42-2	CP43-2	CP44-2
3-phase, 4 wires, unbalanced	CP42-3	CP43-3	CP44-3

CP_ programmable measuring transducers

CP300_, CP400_

Measurement parameters	CP300X	CP400x
Line and phase voltage (RMS)	•	•
Current (RMS)	•	•
Total and phase active power	•	•
Total and phase cosine of ϕ	•	•
Total and phase reactive power	•	•
Total and phase apparent power	•	•
Frequency	•	•
Positive active energy	•	•
Inductive reactive energy	•	•
Capacitive reactive energy	•	•
THD current and voltage	•	•

General features	CP300X	CP400x
Analog outputs	3	4
Pulse outputs / contacts / alarms	2	2
Programmable	•	•
Communication: RS 485 or RS 232* digital output	•	•
Analysis / management software	•	•

(*) Both communications in CP300X

Input features	Range
Rated voltage	100, 110, 230, 400 or 440 V
Rated current	X/1 A or X/5 A
AC and DC auxiliary power supply (Universal)	85 - 264 V AC & 90 - 300 V DC
DC auxiliary power	18 - 72 V AC
Frequency	50 or 60 Hz

Output features	Range
Current	0-1, 0-5, 0-10, 0-20 mA 4 - 20 mA
Voltage	10 V
Serial port	RS 485 or RS 232

Network type	Models
Single-phase	CP3000
Three-phase balanced 3 or 4 wires	CP3001
Three-phase unbalanced 3 wires, 2 systems	CP3002
Three-phase unbalanced 4 wires, 3 systems	CP3003
Single-phase	CP4000
Three-phase balanced 3 or 4 wires	CP4001
Three-phase unbalanced 3 wires, 2 systems	CP4002
Three-phase unbalanced 4 wires, 3 systems	CP4003

Permissible THD in transducers

According to the model

Model	In	Un
Current transducers		
ATI	< 0,5 %	
ATIz	< 0,5 %	
ATI3	< 0,5 %	
ATIz3	< 0,5 %	
ATIa	< 0,5 %	
ATIa3	< 0,5 %	
ATIB	Not affected	
ATIBI	Not affected	
ATIP	Not affected	
Voltage transducers		
ATU		< 0,5 %
ATU3		< 0,5 %
ATUa		< 0,5 %
ATUa3		< 0,5 %
ATUVn		< 0,5 %
ATUP		Not affected
Frequency transducers		
ATF		< 20 %
ATFa		Not affected
Programmable transducers		
ATIP	Not affected	
ATUP		Not affected
CP40	Not affected	Not affected
Active power transducers		
ATW	< 20 %	< 20 %
ATWI	< 20 %	< 20 %
ATWIn	< 20 %	< 20 %
ATWII	< 20 %	< 20 %
ATW3	< 20 %	< 20 %
Reactive power transducers		
ATWr	< 0,5 %	< 0,5 %
ATWIr	< 0,5 %	< 0,5 %
ATWInr	< 0,5 %	< 0,5 %
ATWIIr	< 0,5 %	< 0,5 %
ATW3r	<0,5 %	< 0,5 %
Combined active and reactive power transducers		
View active and reactive tables		
Phase angle transducers		
ATA		< 20 %
ATAI	< 20 %	< 20 %
ATAU		< 20 %