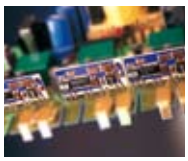
TRIAD 2 Range

Programmable digital transducers with 1 to 4 analogue outputs
Programmable accuracy class

PRODUCT ADVANTAGES

- **Up to 4 PROGRAMMABLE ANALOGUE OUTPUTS**
- **4 kV INSULATION**
- **CONFIGURABLE AND MODIFIABLE** using the TRIADJUST 2 software
- **ADJUSTABLE** accuracy within Class 0.1 as per IEC 60688
- **ADJUSTABLE RESPONSE TIME** down to 50 ms
- **DIGITAL OUTPUT** available as an **OPTION**



Multi-function, economical instrument with 4 functions in the same casing

Communication, Ethernet RS 485 or optical head

Accessibility and safety: large-dimension terminals Insulated circuits

Ergonomic: easy mounting on DIN rail or switchboard

► Main specifications

Quantities measured: 1, 2, 3, 4 to be chosen from I, V, U, F, FP, P, Q, S, cosφ, φ, φU, φV, tanφ
Configuration of TRIAD 2: in factory or by the user with the TRIADJUST 2 software
Accuracy (programmable): Class 0.1 / 0.15 / 0.2 /0.5 / 1
Current inputs: 1 A and 5 A
Voltage inputs: 100 to 480 V (ph-ph) or 100 / √3 to 480 / √3 V (ph-N)
Transfer curves: linear, 2 slopes or quadratic
Output signals: ± 1 mA, ± 5 mA, ± 20 mA, ± 1V, ± 10V
Response time in Class 0.2: 200 ms
Operating frequency: 50 or 60 Hz
Auxiliary power supply with wide dynamic range: 80 to 265 V ac/dc or 19 to 58 V dc
Compliance with CE directive
Digital technology

TRIAD 2
Programmable model

Factory-programmable

- **The transducer delivered is ready to operate and can be connected to the electrical network in order to deliver output signals tailored for your installation.**
- To benefit from this, you simply need to know the exact specifications of your electrical installation:
  - Type of network: single-phase, balanced or unbalanced three-phase , 3 or 4 wires.
  - Type of electrical connections.
  - Number of electrical quantities to be measured: 1, 2, 3 or 4.
  - Precise measurement ranges of the input/output quantities to be measured.

Users can modify a factory configuration at any time with the TRIADJUST 2 software if the specifications of the electrical network change.

Programmable via TRIADJUST 2

- **With the TRIADJUST 2 software and one of the 3 communication modes available (Ethernet, RS485 or optical head) you can program all the parameters characterizing a TRIAD 2 transducer.**
- To do so, simply choose a model which suits your electrical installation:
  - Type of network: single-phase, balanced or unbalanced three-phase, 3 or 4 wires.
  - Number of analogue outputs required (1, 2 3 or 4).
  - Value of the auxiliary source.
- You are then free to configure the TRIAD 2 transducer delivered as you wish and to print out the stickers corresponding to the parameters programmed.

Environment and standards

EMC IMMUNITY (standard of reference: IEC 60688, IEC 61326-1, IEC 61000-6-5)	
Shock voltage as per IEC 61000-4-5	2 kV in differential mode 4 kV in common mode
Oscillating wave as per IEC 61000-4-12	1 kV in differential mode 2.5 kV in common mode
Fast electrical transients in bursts as per IEC 61000-4-4	2 kV on power supply 2 kV on inputs/outputs
Electrostatic discharge as per IEC 61000-4-2	8 kV in the air 6 kV in contact
EM radiated field as per IEC 61000-4-3	10 V/m (80 MHz to 3 GHz)
Voltage dips as per IEC 61000-4-11	30% reduction during 20 ms 60% reduction during 1 s
Voltage interruptions as per IEC 61000-4-11	100% reduction during 100 ms 100% reduction during 100 ms

EMC emissions	
Radiated and conducted	As per CISPR11
Climatic specifications (IEC 60068 2-1/2-2/2-30)	
Operating temperature	-10°C to +55°C
Storage temperature	-40°C to +70°C
Relative humidity	≤ 95% to 55°C
Safety specifications (IEC 61010-1)	
Installation category	3
Pollution level	2
Fire resistance	UL94, severity V0
Mechanical specifications (IEC 60068 2-6/2-27/2-29/2-32/2-63)	
Protection rating	IP 20
Mechanical shocks	IEC 60068-2-27
Vibrations	IEC 60068-2-6
Drop test with packaging	NF 0042-1

Mounting accessories

Model	Reference
Plate mounting for T1xy	ACCT 1007
Plate mounting for T3xy	ACCT 1006

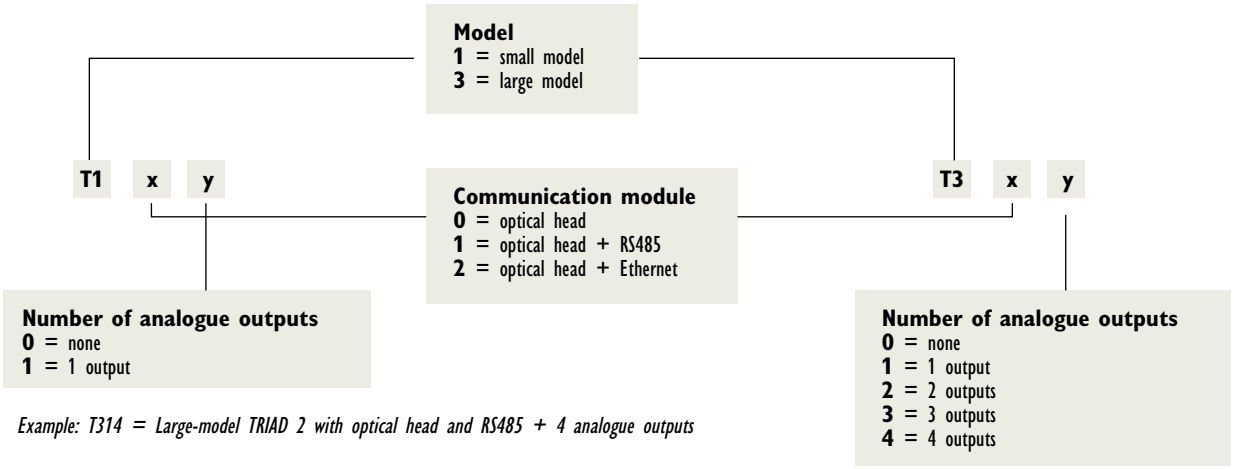
Casing

Weight	320g (T1xy) / 700g (T3xy)
Mounting	DIN rail 43700 or plate mounting
Connection	Terminals with mobile stirrup clamp with screw for 4 single-wire 6 mm² conductors or 2 multi-wire 4 mm² conductors

TRIAD 2 Range

Hardware identification

The TRIAD 2 T1xy and T3xy are fully configurable with the TRIADJUST 2 software which allows users to modify the characteristics of their products right up to the last minute.



Example: T314 = Large-model TRIAD 2 with optical head and RS485 + 4 analogue outputs

Network	Function	T1xy model	T3xy model
Single-phase	V	•	•
	I	•	•
	F	•	•
	P	•	•
	Q	•	•
	S	•	•
	FP	•	•
	Tanφ	•	•
	Cosφ	•	•
	φ	•	•
Balanced 3-phase, 3 wires	U12, U23, U31	•	•
	I1, I2, I3	•	•
	F	•	•
	Pt	•	•
	Qt	•	•
	St	•	•
	FPt	•	•
	Tanφ	•	•
	Cosφt	•	•
	φt	•	•
Balanced 3-phase, 4 wires	V1, V2, V3	•	•
	U12, U23, U31	•	•
	I1, I2, I3	•	•
	F	•	•
	P1, P2, P3, Pt	•	•
	Q1, Q2, Q3, Qt	•	•
	S1, S2, S3, St	•	•
	FP1, FP2, FP3, FPt	•	•
	Tanφ	•	•
	Cos (φ1, φ2, φ3, φt)	•	•
	φ1, φ2, φ3, φt	•	•
Unbalanced 3-phase, 3/4 wires	V1, V2, V3		•
	U12, U23, U31		•
	I1, I2, I3		•
	F		•
	P1, P2, P3, Pt		•
	Q1, Q2, Q3, Qt		•
	S1, S2, S3, St		•
	FP1, FP2, FP3, FPt		•
	Tanφ		•
	Cos (φ1, φ2, φ3, φt)		•
	φ1, φ2, φ3, φt		•
	φ (U12/U23, U23/U31, U31/U12)		•
	φ (V1/V2, V2/V3, V3/V1)		•

TRIAD 2
Programmable model

Electrical specifications

Voltage input		
Rated value	T1: from 57.7 Vac to 276 Vac max. T3: from 57.7 Vac to 480 Vac max.	
Frequency	50 Hz: 42.5...57.5 Hz 60 Hz: 51...69 Hz	
Max. measured voltage on primary	650 kV (ph-ph)	
Acceptable overloads	T1: 300 Vac permanent - 460 Vac / 10s T3: 520 Vac permanent - 800 Vac / 10s	
Consumption	< 0.2 A	
Input impedance	400 kΩ	
Current inputs		
Rated value	0 to 10 A max.	
Max. measured current on primary	25,000 A	
Acceptable overload	50 In / 1 s	
Consumption	< 0.15 VA	
Auxiliary power supply		
High level	80 / 265 Vac (50/60 Hz) – 80 / 265 Vdc	
Low level	19 / 58 Vdc	
Consumption	**High level**	**Low level**
	T1: 8.5 VA max. T3: 20 VA max.	T1: 5 W max. T3: 10 W max.
Analogue outputs		
Rated values	**Current**	**Voltage**
	± 1mA, ± 5mA, ± 20mA	± 1 V, ± 10 V
Acceptable resistive load	15 V / Io (1)	≥ 1 kΩ
Acceptable capacitive load	0.1 µF	0.1 µF
Overrun	1.2 Io (1)	1.2 Uo (1)
Peak-peak residual wave	± 0.2% of Io (1)	± 0.2% of Uo (1)
Programmable response time	50 ms – 100 ms – 200 ms – 500 ms – 1 s	
Transfer curve	Linear, 2 slopes or quadratic	

(1) Io = output current, Uo = output voltage

Communication

	Optical head	**Ethernet**	**RS485**
Connection	USB (PC) Optical (product)	RJ45	2 wires Half-duplex
Protocol	MODBUS RTU mode	MODBUS / TCP RTU mode	MODBUS / JBUS RTU mode
Speed	38,400 baud	10 base T	2,400 to 115,200 baud
Parity	-	-	Even, odd or none
JBus addresses	-	-	1 to 247
Transmission length	2 m	100 m	1.2 km as EIA 485

Metrological specifications

Measurements	**Accuracy classs over measurement range** (as per IEC 60688)				
	RT = 50 ms	RT = 100 ms	RT = 200 ms	RT = 500 ms	RT = 1s
V, U, I, F, P, Q, S, FP, Tanφ, Cosφ, φ, φU, φV	± 1%	± 0.5%	± 0.2%	± 0.15%	± 0.1%

* RT: Response time for F = 50 Hz

** Phase angle between voltages

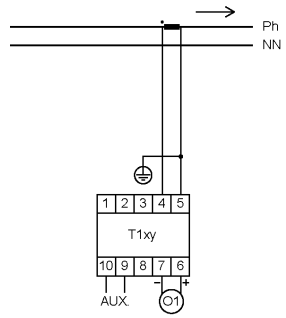
TRIAD 2 Range

Electrical connections

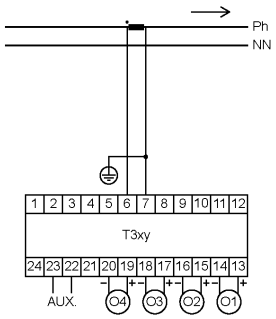
Single-phase network

I1, F:

TD201

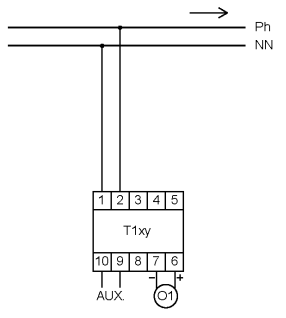


TD202

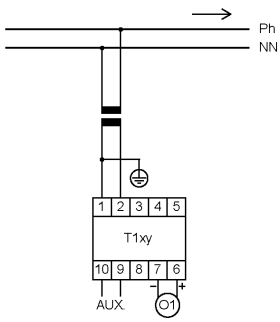


V1, F:

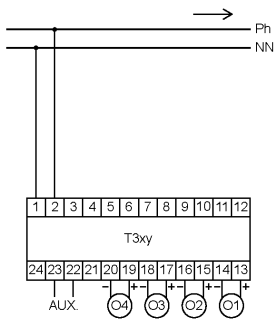
TD203



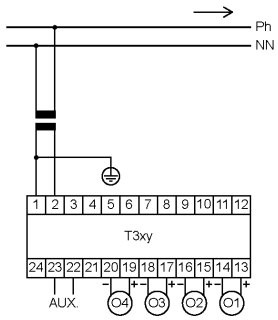
TD204



TD205

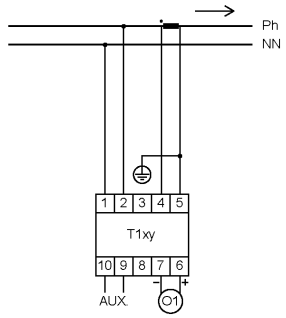


TD206

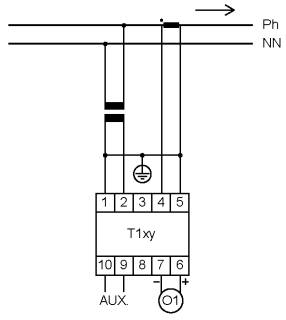


V1, I1, P1, Q1, S1, FP1, F, TANφ, Cosφ1, φ1:

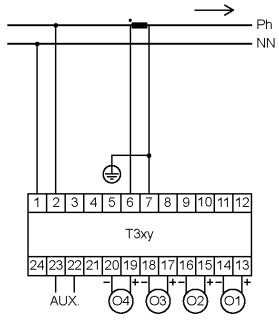
TD207



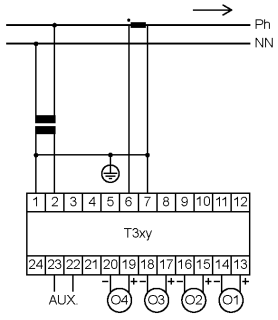
TD208



TD209



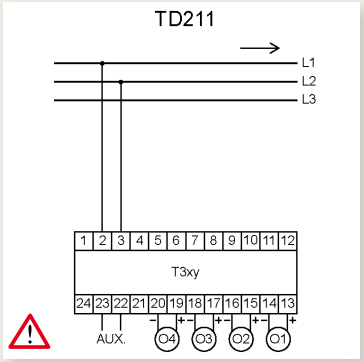
TD210



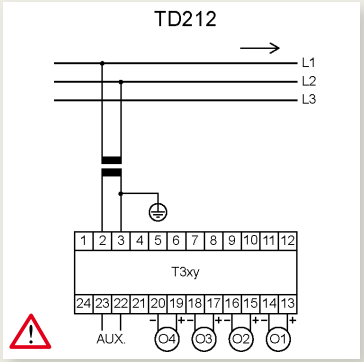
Balanced 3-phase, 3-wire network

U12, U23, U31, F:

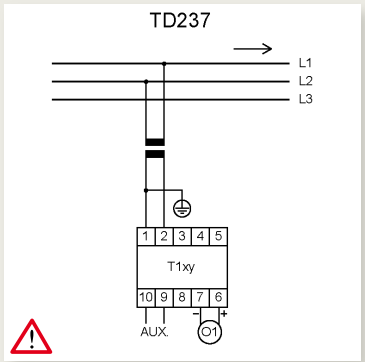
TD211



TD212

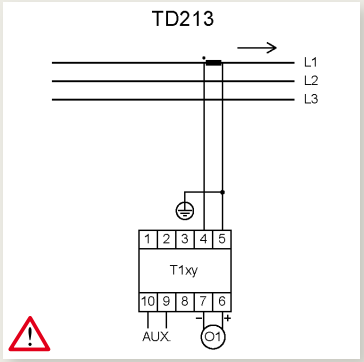


TD237

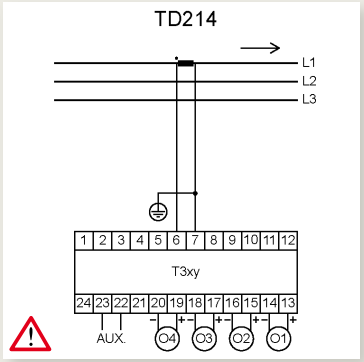


I1, I2, I3, F:

TD213

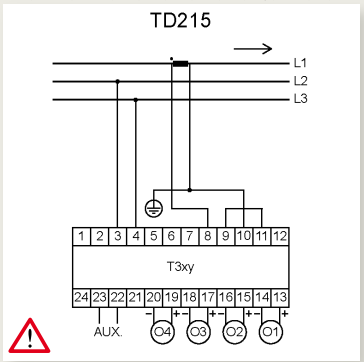


TD214

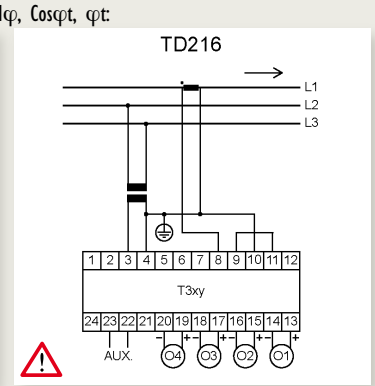


U12, U23, U31, I1, I2, I3, Pt, St, Qt, FPt, F, TANφ, Cosφt, φt:

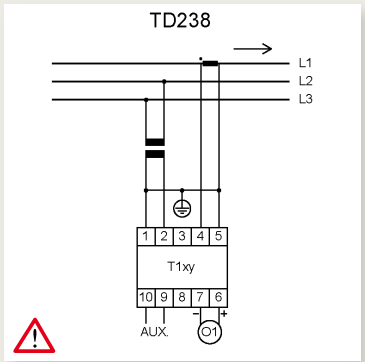
TD215



TD216



TD238



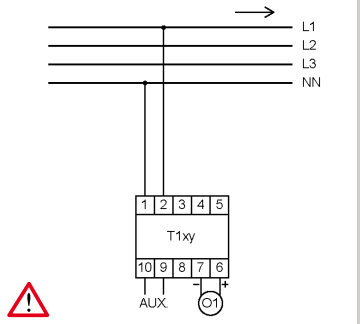
⚠ Phase rotation authorized

TRIAD 2 Range

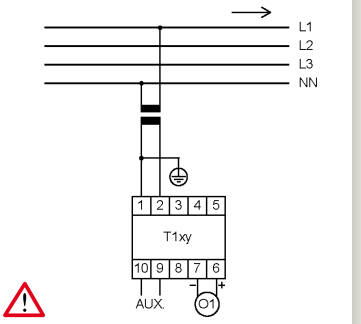
Balanced 3-phase, 4-wire network

V1, V2, V3, U12, U23, U31 F:

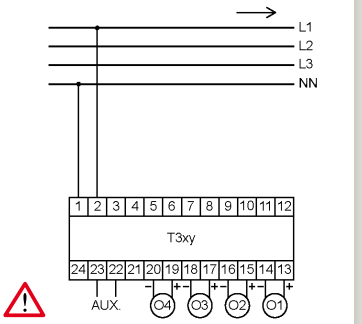
TD217



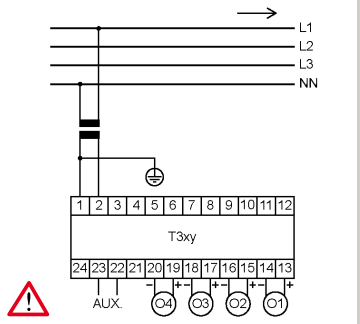
TD218



TD219

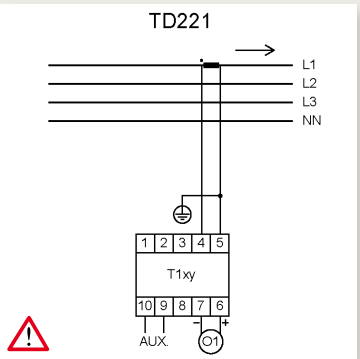


TD220

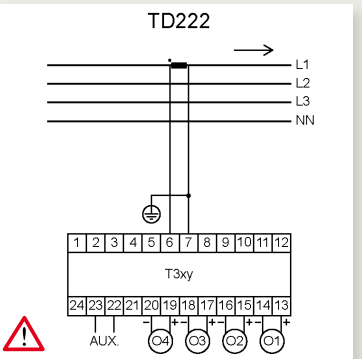


I1, I2, I3, F:

TD221



TD222

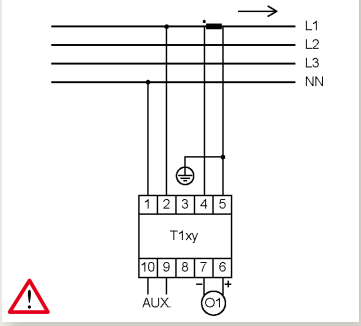


Phase rotation authorized

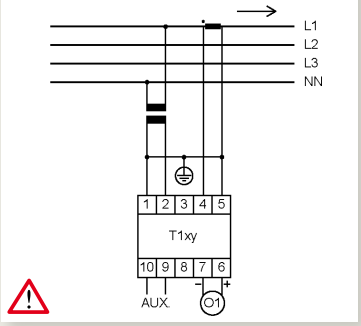
Balanced 3-phase, 4-wire network (continued)

V1, V2, V3, U12, U23, U31, I1, I2, I3, P1, P2, P3, Pt, S1, S2, S3, St, Q1, Q2, Q3, Qt, FP1, FP2, FP3, FPt, F, TANφ, Cosφ1, Cosφ2, Cosφ3, Cosφt, φ1, φ2, φ3, φt:

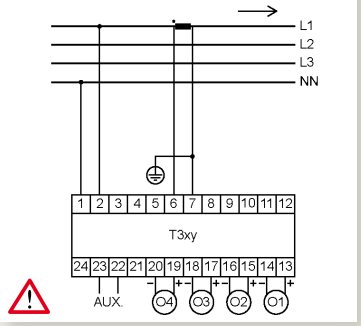
TD223



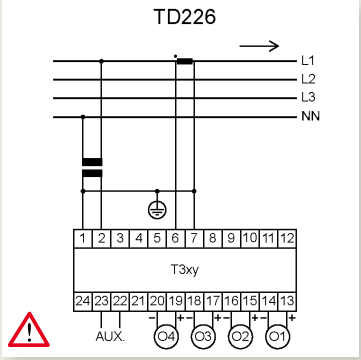
TD224



TD225



TD226

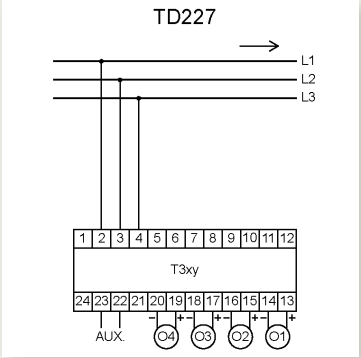


Phase rotation authorized

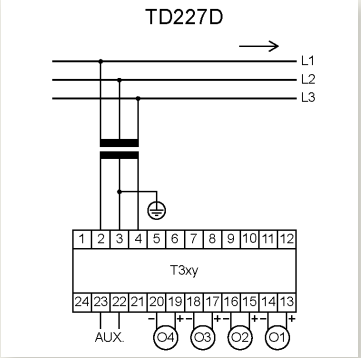
Unbalanced 3-phase, 3-wire network

U12, U23, U31, F, Angle (U12/U23, U23/U31, U31/U12):

TD227

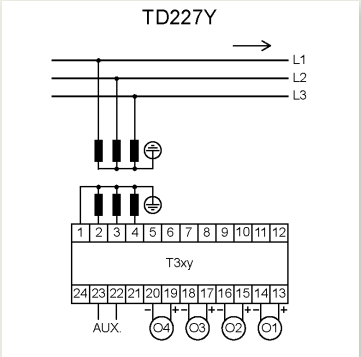


TD227D



V1, V2, V3, U12, U23, U31, F,
Angle (V1/V2, V2/V3, V3/V1),
Angle (U12/U23, U23/U31, U31/U12):

TD227Y

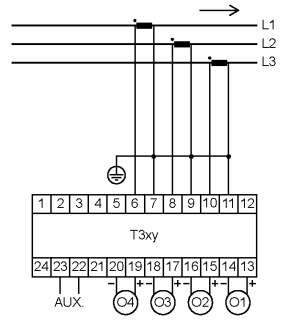


TRIAD 2 Range

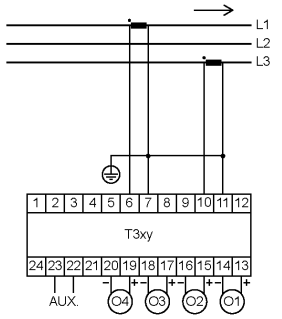
Unbalanced 3-phase, 3-wire network (continued)

I1, I2, I3, F:

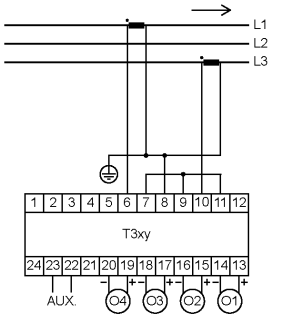
TD228



TD229

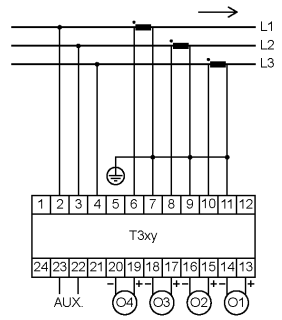


TD230

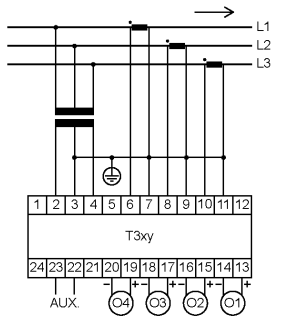


U12, U23, U31, I1, I2, I3, Pt, St, Qt, FPt, F, TANφ, Cosφt, φt, Angle (U12/U23, U23/U31, U31/U12):

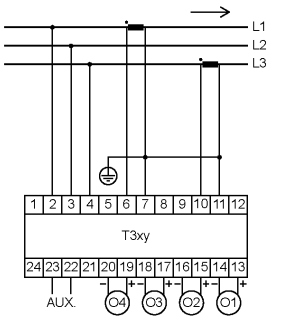
TD231



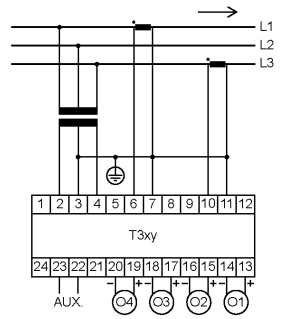
TD231D



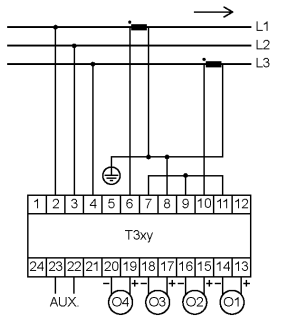
TD232



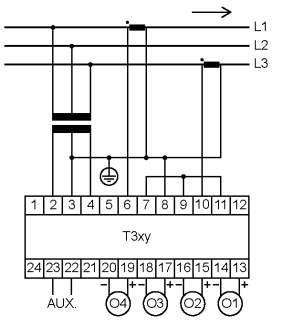
TD232D



TD233

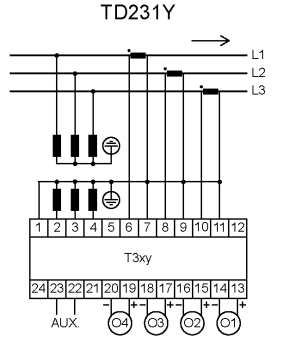


TD233D

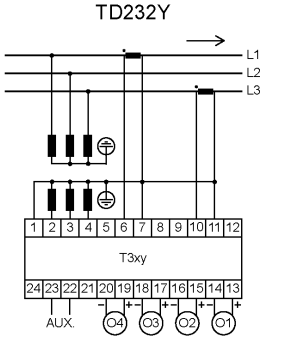


V1, V2, V3, U12, U23, U31, I1, I2, I3, P1, P2, P3, Pt, S1, S2, S3, St, Q1, Q2, Q3, Qt, FP1, FP2, FP3, FPt, F, TANφ, Cosφ1, Cosφ2, Cosφ3, Cosφt, φ1, φ2, φ3, φt, Angle (V1/V2, V2/V3, V3/V1), Angle (U12/U23, U23/U31, U31/U12):

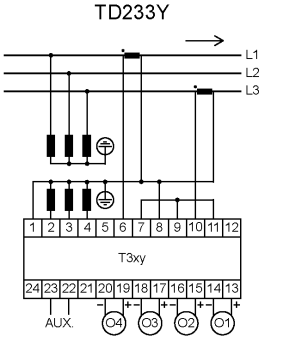
TD231Y



TD232Y



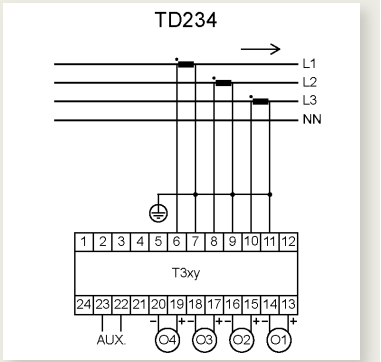
TD233Y



Unbalanced 3-phase, 4-wire network

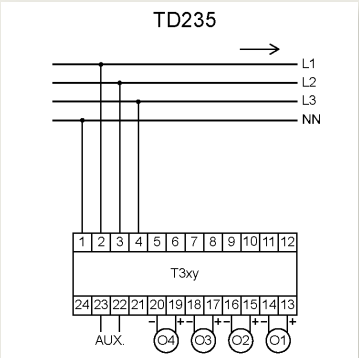
I1, I2, I3, F:

TD234

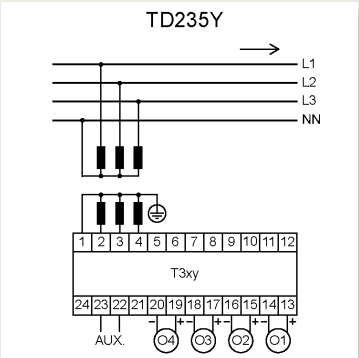


V1, V2, V3, U12, U23, U31, F, Angle (V1/V2, V2/V3, V3/V1), Angle (U12/U23, U23/U31, U31/U12):

TD235

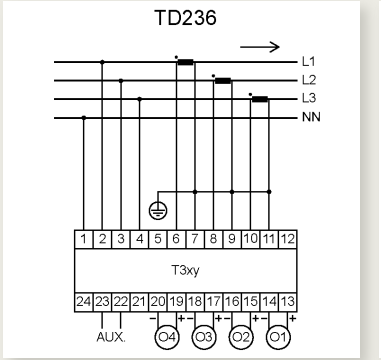


TD235Y

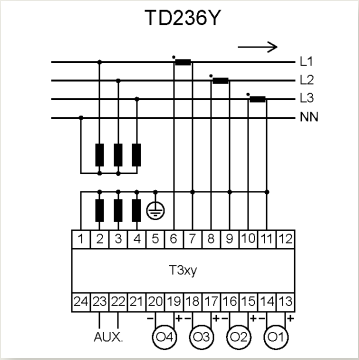


V1, V2, V3, U12, U23, U31, I1, I2, I3, P1, P2, P3, Pt, S1, S2, S3, St, Q1, Q2, Q3, Qt, FP1, FP2, FP3, FPt, F, TANφ, Cosφ1, Cosφ2, Cosφ3, Cosφt, φ1, φ2, φ3, φt
Angle (V1/V2, V2/V3, V3/V1), Angle (U12/U23, U23/U31, U31/U12):

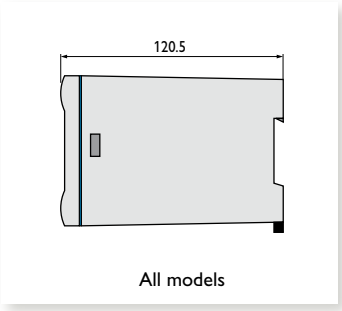
TD236



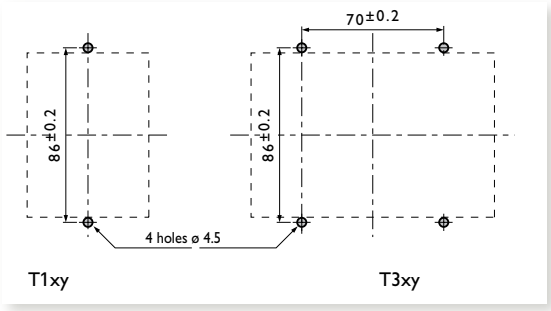
TD236Y



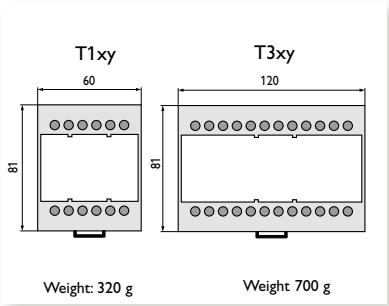
Dimensions (in mm)

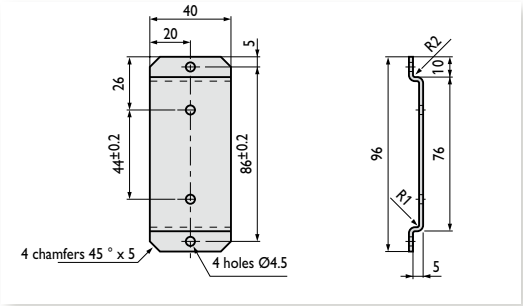


Panel drilling diagram for plate mounting



Accessory for plate mounting with screw (option)





TRIAD 2 Range

TRIAD 2 programmable via TRIADJUST 2

TO ORDER

T1 – SMALL MODEL (60 x 81 x 120.5 mm)

			Without tropicalization	With tropicalization
			Number of input	Number of input
Link	Output	Supply	1	1
Optical	± 20 mA	80-265 V AC/DC	P01380001	P01380002
		19-58 V DC	P01380003	P01380004
	± 10 V	80-265 V AC/DC	P01380005	P01380006
		19-58 V DC	P01380007	P01380008

T3 – LARGE MODEL (120 x 81 x 120.5 mm)

			Without tropicalization				With tropicalization			
			Number of input(s)				Number of output(s)			
Link	Output	Supply	1	2	3	4	1	2	3	4
Optical	± 20 mA	80-265 V AC/DC	P01380101	P01380103	P01380105	P01380107	P01380102	P01380104	P01380106	P01380108
		19-58 V DC	P01380109	P01380111	P01380113	P01380115	P01380110	P01380112	P01380114	P01380116
	± 10 V	80-265 V AC/DC	P01380117	P01380119	P01380121	P01380123	P01380118	P01380120	P01380122	P01380124
		19-58 V DC	P01380125	P01380127	P01380129	P01380131	P01380126	P01380128	P01380130	P01380132

TRIAD 2 factory-programmable

1 Model
T1 : small model – 1 analogue output
T3 : large model – 1 to 4 analogue output(s)

2 Communication
0 : Without
1 : RS485
2 : Ethernet

3 Number of analogue outputs
0 : Without (Choice of a minimum communication)
1 : 1 output
2 : 2 outputs (T3 model only)
3 : 3 outputs (T3 model only)
4 : 4 outputs (T3 model only)

4 Frequency
0 : 50 Hz
1 : 60 Hz

5 Supply
0 : 80-265 V AC/DC
1 : 19-58 V DC

6 Tropicalization
0 : Without
1 : With

7 Analogue output calibres
0 : -20 mA to +20 mA
1 : -5 mA to +5 mA
2 : -1 mA to +1 mA
3 : -10 V to +10 V
4 : -1 V to +1 V

8 Network
0 : Single-phase
1 : Balanced 3-phase, 3 wires
2 : Balanced 3-phase, 4 wires
3 : Unbalanced 3-phase, 3 wires
4 : Unbalanced 3-phase, 4 wires

9 Connection configuration
Indicate the diagram number. E.g. TD204

10 Voltage input
Indicate direct voltage to be measured or the VT ratio

11 Current input
Indicate direct current to be measured or the CT ratio

12 Analogue output
Indicate for each output:

a- Quantity to be measured
b- Transfer curve
c- Input signal: Min – Breaking point - Max
d- Input unity
e- Output signal: Min – Breaking point - Max

To simplify the procedure when ordering you can send us the form on page 207.

Factory-programmed TRIAD 2: order form

1 - Model / Hz

☐ T1 or ☐ T3
☐ 50 Hz or ☐ 60 Hz

2 - Network

☐ Single-phase
☐ 3-wire balanced three-phase
☐ 4-wire balanced three-phase
☐ 3-wire unbalanced three-phase
☐ 4-wire unbalanced three-phase

3 - Options / Connection

☐ Ethernet or ☐ RS485
☐ Tropicalization
Connection diagram: TD ☐☐☐☐

4 - Power supply

☐ 80 to 265 Vac (50/60 Hz) / 80 to 265 Vdc or ☐ 19 to 58 Vdc

5 - Inputs

Current

With current transformer or Direct

Primary / Secondary: ____ / ____ A

Direct: ____ A

Voltage

With voltage transformer or Direct

Primary / Secondary: ____ / ____ V

Direct: ____ V

☐ Phase-phase ☐ Phase-neutral ($\sqrt{3}$)

Available quantities

V1 V2 V3 | U12 U23 U31 | I1 I2 I3 | F | P1 P2 P3 Pt | Q1 Q2 Q3 Qt | S1 S2 S3 St

FP1 FP2 FP3 FPt | TANφ | COSφ1 COSφ2 COSφ3 COSφt | φ1 φ2 φ3 φt

φU12/23 φU23/31 φU31/12 | φV1/2 φV2/3 φV3/1

Output 1

Quantity and measurement range (x)

☐ Indicate quantity to be measured

Min ____ breaking point ____ Max ____ Unit [1] ____

Transfer curve

☐ Linear
☐ 2 slopes
☐ Quadratic

Output signal (y)

Min ____ Breaking point ____ Max ____ ☐ mA ☐ V

Accuracy class

	50 Hz	60 Hz
☐ 0.1%:	1 s	0.8 s
☐ 0.15%:	0.5 s	0.4 s
☐ 0.2%:	0.2 s	0.16 s
☐ 0.5%:	100 ms	80 ms
☐ 1%:	50 ms	40 ms

Output 2

Quantity and measurement range (x)

☐ Indicate quantity to be measured

Min ____ breaking point ____ Max ____ Unit [1] ____

Transfer curve

☐ Linear
☐ 2 slopes
☐ Quadratic

Output signal (y)

Min ____ Breaking point ____ Max ____ ☐ mA ☐ V

Accuracy class

	50 Hz	60 Hz
☐ 0.1%:	1 s	0.8 s
☐ 0.15%:	0.5 s	0.4 s
☐ 0.2%:	0.2 s	0.16 s
☐ 0.5%:	100 ms	80 ms
☐ 1%:	50 ms	40 ms

Output 3

Quantity and measurement range (x)

☐ Indicate quantity to be measured

Min ____ breaking point ____ Max ____ Unit [1] ____

Transfer curve

☐ Linear
☐ 2 slopes
☐ Quadratic

Output signal (y)

Min ____ Breaking point ____ Max ____ ☐ mA ☐ V

Accuracy class

	50 Hz	60 Hz
☐ 0.1%:	1 s	0.8 s
☐ 0.15%:	0.5 s	0.4 s
☐ 0.2%:	0.2 s	0.16 s
☐ 0.5%:	100 ms	80 ms
☐ 1%:	50 ms	40 ms

Output 4

Quantity and measurement range (x)

☐ Indicate quantity to be measured

Min ____ breaking point ____ Max ____ Unit [1] ____

Transfer curve

☐ Linear
☐ 2 slopes
☐ Quadratic

Output signal (y)

Min ____ Breaking point ____ Max ____ ☐ mA ☐ V

Accuracy class

	50 Hz	60 Hz
☐ 0.1%:	1 s	0.8 s
☐ 0.15%:	0.5 s	0.4 s
☐ 0.2%:	0.2 s	0.16 s
☐ 0.5%:	100 ms	80 ms
☐ 1%:	50 ms	40 ms

[1] Please indicate the unit of the measurement range, e.g. W, kW or MW

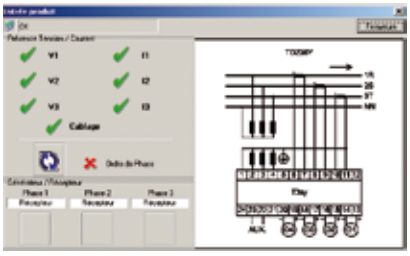
TRIADJUST 2 software

Designed for quick configuration and display of all the parameters of your TRIAD 2 transducers

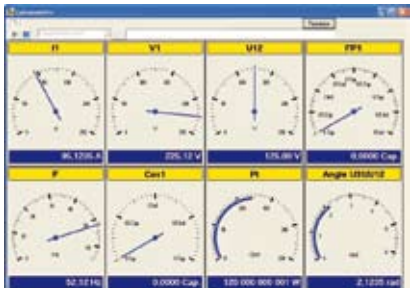
PRODUCT ADVANTAGES

- **CONFIGURATION** via **OPTICAL HEAD, ETHERNET** or **RS485**
- **ACCESS** to **ALL** the **TRIAD 2 PARAMETERS**
- **DIAGNOSIS** of the **INSTALLATION**
- **LABEL PRINTING** on **ALL TYPES OF LASER PRINTERS**

Configuration
- Inputs / Outputs
- Communication
- Connection diagram
- Response time



Diagnosis
- Voltage inputs
- Current inputs
- Cabling
- Phase order
- Analogue outputs
- Fresnel



Display
- Instantaneous quantities (in digital or analogue form)

Recording
- In real time in exported file

Description

The **TRIADJUST 2** software allows quick, unlimited programming of all your TRIAD 2's parameters.

Using a PC and the optical lead supplied in each kit, connect your product's auxiliary power supply to dialogue with total security. Depending on your TRIAD 2's configuration, remote communication is possible via RS485 or Ethernet.
In the Windows™ environment, initialize or simply modify the quantities measured, the measurement ranges and the analogue outputs on the transducers installed.
TRIADJUST 2 also offers other functions such as **DIAGNOSIS** of your network, instantaneous **DISPLAY** of the electrical quantities and REAL-TIME **RECORDING** of the measurements in an exported file.

You can also print labels indicating the configurations and connections of your products.

Minimum configuration

Platform: PC
Operating system: Windows 2000 or XP
Processor: Pentium-compatible
RAM: 128 MB
Hard disk: 40 GB
Drive: CD-ROM
Communication port:
Local: USB 1.1 minimum
Remote: RS485 and/or Ethernet

KIT TRIADJUST 2

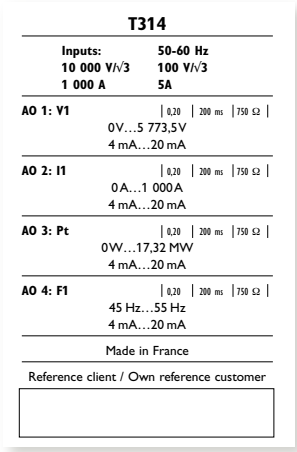
The **TRIADJUST 2 configuration kit** comprises:
- The TRIADJUST 2 software
- An optical / USB lead
- 30 sheets of blank labels
- A 230 x 185 x 45 mm carrying case

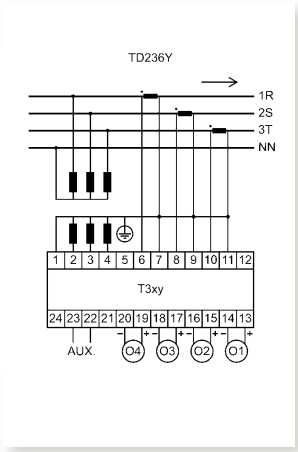
TRIADJUST 2 "PREMIER"

This module is a **complete tool** designed for distributors or any user needing to program a large number of transducers
The TRIADJUST 2 "PREMIER" configuration workstation comprises:
- The TRIADJUST 2 software
- An optical / USB lead
- A benchtop power-supply base
- 210 sheets of blank labels
- A 500 x 400 x 270 mm carrying case

Labels common to both kits

A sheet contains two labels, one for the configuration of the inputs/outputs and the other for the programmed connection diagram. The labels can be printed on all types of laser printers.





TO ORDER

Model	Reference
TRIADJUST 2 kit	P01380410
TRIADJUST 2 "PREMIER" workstation	P01380420
Accessories	
Set of 30 sheets of blank labels	P01380400
Optical/USB lead	P01330403

Associated product

TRIAD 2 programmable
with TRIADJUST 2

► page 197

TSP 2 Range

Self-powered version for applications requiring the conversion of a single AC current or voltage quantity. 1 analogue output class 0.2 for all type of electrical network

PRODUCT ADVANTAGES

- **SELF-POWERED**
- **CLASS 0.2**
- **WIDE CHOICE OF INPUTS CALIBRED**
- **RESPONSE TIME** of 100 ms for **TSPI** and 200 ms for **TSPU**

Accessibility and safety: large-dimension terminals Insulated circuits

Ergonomic: easy mounting on DIN rail or switchboard

► Main specifications

TSPU
Quantity measured: Vac, Uac
Accuracy: Class 0.2
Inputs: AC voltage: 57.5 V to 400 V (fixed calibres)
Analogue output calibres: 0-10 mA, 0-20 mA, 0-5 V, 0-10 V
Operating frequency: 45 to 65 Hz

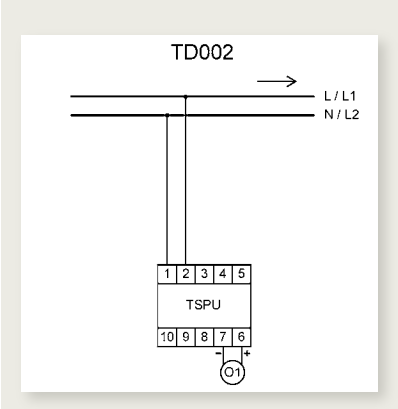
TSPI
Quantity measured: Iac
Accuracy: Class 0.2
Inputs: AC current: 1 A or 5 A (fixed calibres)
Analogue output calibres: 0-10 mA, 0-20 mA
Operating frequency: 45 to 65 Hz

Functions

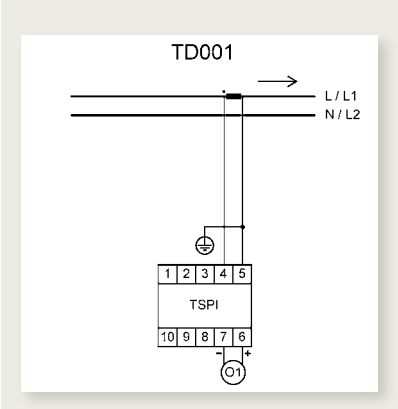
Network	Function	TSPI model	TSPU model
Single phase	V		•
	I	•	
Balanced 3-phase 3 wires	U12 or U23 or U31		•
	I1 or I2 or I3	•	
Balanced 3-phase 4 wires	V1 or V2 or V3 or U12 or U23 or U31		•
	I1 or I2 or I3	•	
Unbalanced 3-phase 3 wires	U12 or U23 or U31		•
	I1 or I2 or I3	•	
Unbalanced 3-phase 4 wires	V1 or V2 or V3 or U12 or U23 or U31		•
	I1 or I2 or I3	•	

Electrical connections

TSPU



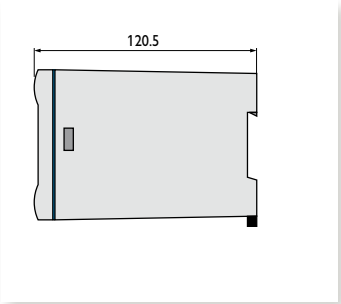
TSPI

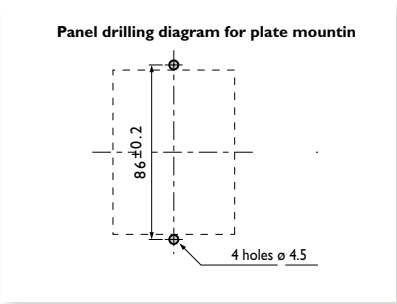


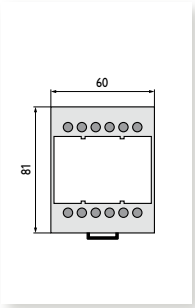
⚠ The terminal 1 can be connected either on the neutral or on one phase of the electrical network

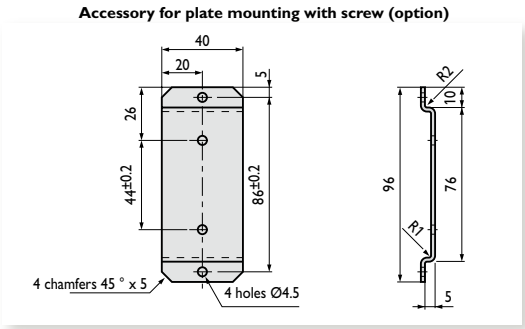
TSP 2 Range

Dimensions (in mm)









Environment and standards

Standard of reference: CEI 60688	
EMC IMMUNITY	
Shock voltage	IEC 61000-4-5
Oscillating wave	IEC 61000-4-12
Fast electrical transients in bursts	IEC 61000-4-4
Electrostatic discharge	IEC 61000-4-2
EM radiated field	IEC 61000-4-3

Climatic specifications (CEI 60068 2-1 / 2-2 / 2-30)	
Operating temperature	-10°C to +55°C
Storage temperature	-40°C to +70°C
Relative humidiy	≤ 95% at 55°C
Safety specifications (IEC 61010-1)	
Installation category	3
Pollution level	2
Fire resistance	UL94, severity V0
Mechanical specifications	
Protection rating	IP 20
Mechanical shocks	IEC 60068-2-27
Vibrations	IEC 60068-2-6
Drop test with packaging	NF H0042-1

Mounting accessories

Model	Reference
Plate mounting	ACCT 1007

Casing

Weight	320g
Mounting	DIN rail 43700 or plate mounting
Connection	Terminals with mobile stirrup clamp with screw for 4 single-wire 6 mm² conductors or 2 multi-wire 4 mm² conductors

Electrical and metrological specifications

Model	TSPI I (rms)	TSPU U or V (rms)
Current or voltage input		
Rated value	In = 1 or 5 A	Vn = 100/√3, 110/√3, 120/√3 V Un = 100, 110, 120, 230, 400 V
Frequency Fn	46...65 Hz	46...65 Hz
Measurement range 0...Xmax	0...100% of In	0...100% of Un/Vn
Consumption	2 VA	2 VA
Maximum overloads	2 In permanent 20 In / 1 s 40 In / 0.5 s	1.5 Un permanent 2 Un / 1 s 4 Un / 0.5 s
Analogue output		
Transfer curve	linear	
0…Ymax	0...10 mA 0...20 mA	0...10 mA 0...20 mA 0...5 V 0...10 V
Accuracy	Class 0.2: 10…100% of In	Class 0.2: 50…100% of Vn / Un
Response time	< 100 ms	< 200 ms
Operating resistance	15 V /Is	≥ 1 kΩ
Peak-peak residual wave	40 µA	20 mV
Auxiliary power supply		
Self-powered	•	•

Parameters to be indicated when ordering

TO ORDER

TSPI

Input	Output	Tropicalization with	Tropicalization without
0…1 A	0…10 mA	P01 3751 01	P01 3751 05
	0…20 mA	P01 3751 02	P01 3751 06
0…5 A	0…10 mA	P01 3751 03	P01 3751 07
	0…20 mA	P01 3751 04	P01 3751 08

TSPU

Input	Output	Tropicalization with	Tropicalization without
0…57.7 V	0…10 mA	P01 3752 01	P01 3752 33
	0…20 mA	P01 3752 02	P01 3752 34
	0…5 V	P01 3752 03	P01 3752 35
	0…10 V	P01 3752 04	P01 3752 36
0…63.5 V	0…10 mA	P01 3752 05	P01 3752 37
	0…20 mA	P01 3752 06	P01 3752 38
	0…5 V	P01 3752 07	P01 3752 39
	0…10 V	P01 3752 08	P01 3752 40
0…69.3 V	0…10 mA	P01 3752 09	P01 3752 41
	0…20 mA	P01 3752 10	P01 3752 42
	0…5 V	P01 3752 11	P01 3752 43
	0…10 V	P01 3752 12	P01 3752 44
0…76.2 V	0…10 mA	P01 3752 65	P01 3752 66
0…100 V	0…10 mA	P01 3752 13	P01 3752 45
	0…20 mA	P01 3752 14	P01 3752 46
	0…5 V	P01 3752 15	P01 3752 47
	0…10 V	P01 3752 16	P01 3752 48

TSPU

Input	Output	Tropicalization with	Tropicalization without
0…110 V	0…10 mA	P01 3752 17	P01 3752 49
	0…20 mA	P01 3752 18	P01 3752 50
	0…5 V	P01 3752 19	P01 3752 51
	0…10 V	P01 3752 20	P01 3752 52
0…120 V	0…10 mA	P01 3752 21	P01 3752 53
	0…20 mA	P01 3752 22	P01 3752 54
	0…5 V	P01 3752 23	P01 3752 55
	0…10 V	P01 3752 24	P01 3752 56
0…230 V	0…10 mA	P01 3752 25	P01 3752 57
	0…20 mA	P01 3752 26	P01 3752 58
	0…5 V	P01 3752 27	P01 3752 59
	0…10 V	P01 3752 28	P01 3752 60
0…400 V	0…10 mA	P01 3752 29	P01 3752 61
	0…20 mA	P01 3752 30	P01 3752 62
	0…5 V	P01 3752 31	P01 3752 63
	0…10 V	P01 3752 32	P01 3752 64