



# DIRIS Digiware R-60

## Residual Current Monitoring module

Residual Current Monitoring

new



diris-dw\_173\_front

DIRIS Digiware R-60



Configuration with Easy Config System software.

### Function

DIRIS Digiware R-60 modules combine residual current monitoring (RCM) with power metering and monitoring functions, for any combination of 1-phase, 2-phase or 3-phase circuits used in TN-S and TT earthing systems.

With six RJ12 channels, they can be connected to a mix of  $\Delta$ IC residual CTs and TE/TR/ITR/TF current sensors via RJ12 cables enabling quick connection and avoiding wiring errors.

### Advantages

#### 2 in 1

One DIRIS Digiware R-60 module can be connected to residual CTs and traditional TE/TR/ITR/TF current sensors to pool residual current and power monitoring.

#### Multi-circuit

One DIRIS Digiware R-60 module can monitor the residual current on up to 6 circuits.

The Digiware modular concept allows several R-60 modules to be added within a single system, making it easy to implement RCM for a large number of outgoing circuits instead of the main incomer only.

#### Plug & Play solution

The Digiware concept and the RJ45 bus allow:

- easy connection of R-60 modules to an existing DIRIS Digiware system,
- optimal scalability by adding additional modules when needed.

The connection to current sensors is quick and error-free thanks to colour coded RJ12 cables.

#### Smart alarming

DIRIS Digiware R-60 provides the most advanced RCM alarm features for preventive notifications:

- before the residual current device (RCD) trips,
- before leakage currents become hazardous for people and assets,
- if the RCD is defective.

The combination with Virtual Monitor technology specifies if the RCD has tripped on an overload or a high residual current.

#### Patented innovation

Thanks to an automatic learning sequence, launched for a chosen duration representative of the normal operation of the electrical installation, 6 dynamic residual current ( $I_{\Delta}$ ) thresholds are automatically set. This facilitates the determination of the maximum residual current not to be exceeded for each outgoing circuit.

### The solution for

- > Industries
- > Data centres



### Strong points

- > 2 in 1
- > Multi-circuit
- > Plug & play solution
- > Smart alarming
- > Patented innovation

### Compliance with standards

- > IEC 62020
- > IEC 61557-12



- > ISO 14025

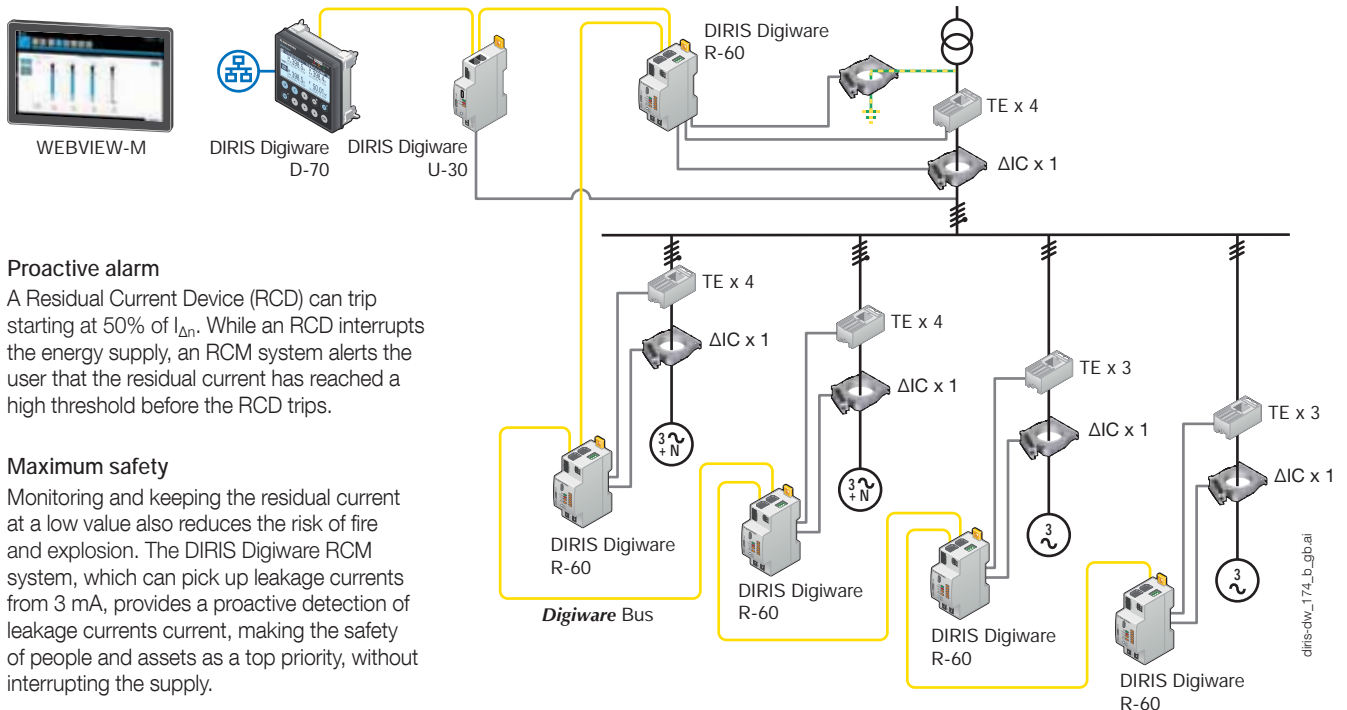


### Create your project

- > Find the best DIRIS Digiware configuration: [www.meter-selector.com](http://www.meter-selector.com)



## Applications



### Proactive alarm

A Residual Current Device (RCD) can trip starting at 50% of  $I_{\Delta n}$ . While an RCD interrupts the energy supply, an RCM system alerts the user that the residual current has reached a high threshold before the RCD trips.

### Maximum safety

Monitoring and keeping the residual current at a low value also reduces the risk of fire and explosion. The DIRIS Digiware RCM system, which can pick up leakage currents from 3 mA, provides a proactive detection of leakage currents current, making the safety of people and assets as a top priority, without interrupting the supply.

### Protective earthing (PE) conductor


Adding a residual CT on the upstream PE conductor is essential to ensure the proper connection to earth. It is also the easiest and cheapest way to measure the upstream residual current reliably.

### Compliance with installation standards

Many local electrical codes require an insulation resistance measurement as part of the Periodic Inspection and Testing. This operation is costly as it must be done on all outgoing circuits and intrusive as the main protective device must be opened.

*According to IEC 60364-6 installation standards and many national transpositions, periodic insulation resistance testing is not necessary if permanently monitored by an RCM solution such as the DIRIS Digiware RCM system.*

## Measurements

	
<b>DIRIS Digiware R-60</b>	
Residual Current Monitoring	
$I_{\Delta}$	•
$I_{PE}$	•
Metering	
+/- kWh, +/- kvarh, kVAh	•
Multi-tariff (max 8)	•
Load curves	•
Multi-measurement	
$I_1, I_2, I_3, I_n, \Sigma P, \Sigma Q, \Sigma S, \Sigma PF$	•
P, Q, S, PF per phase	•
Alarms	
Dynamic $I_{\Delta}$ and $I_{PE}$ thresholds	•
Overloaded neutral conductor	•
Protective device (opening, Trip, defective RCD)	•
$I_{\Delta}$ and $I_{PE}$ comparisons	•
Trends	
$I_{\Delta}$	•
$I_{PE}$	•
Load curves	•

## Front face



1. USB port for configuration.
2. ON LED. Lights when the device is active.
3. ALARM LED for system alarms (CT disconnected, etc.)
4. COM LED. Flashes when the communication bus is active.
5. RCM FAULT. Lights if there is an RCM alarm on any of the channel 1 through 6.
6. TEST / RESET button. Starts the auto test (long press) and resets alarms (short press). Used during auto-discovery process for the resolution of address conflicts.
7. Individual LED alarm signals for each channel 1 to 6.

# DIRIS Digiware R-60

## Residual Current Monitoring module

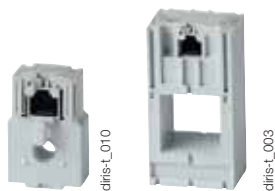
### Connections

#### Associated sensors

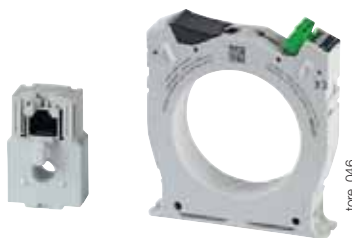
Various types of residual CTs and current sensors can be connected to the DIRIS Digiware R-60 module:  $\Delta$ IC solid-core,  $\Delta$ IP-R split-core residual CTs, and solid-core TE, split-core TR/iTR, flexible TF current sensors. This range of sensors can be adapted to all types of new or existing installations. A rapid RJ12 connection makes wiring easy and reliable and prevents wiring errors.

For more information: refer to the residual CTs and current sensors catalogue pages

#### TE solid current sensors



#### $\Delta$ IC solid-core residual CTs



#### TR/iTR split-core current sensors



#### TF Flexible current sensors



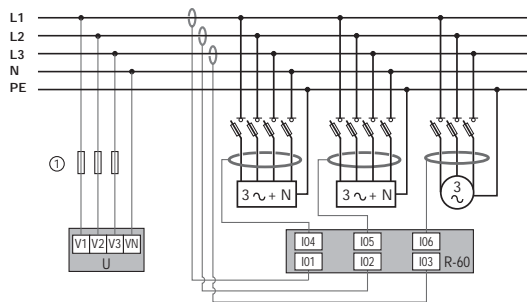
#### $\Delta$ IP-R split-core residual CTs



### Connection examples

#### RCM ( $I_{\Delta}$ ) – 3 x 3-Ph load

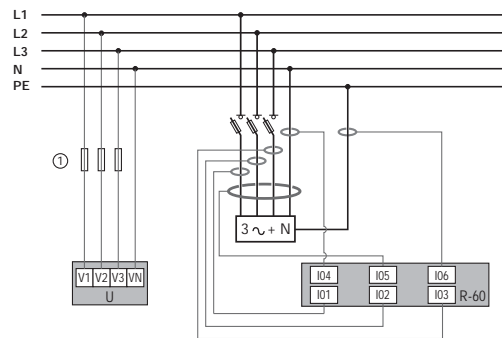
Load current monitoring – L1, L2, L3, upstream



diris-dw\_176\_b\_1\_x\_catal

#### RCM ( $I_{\Delta} + I_{PE}$ ) – 1 x 3-Ph load

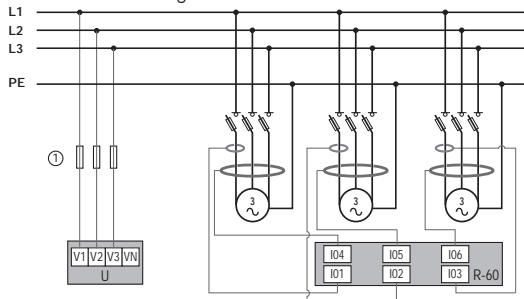
Load current monitoring – 1 x 3-Ph load (L1, L2, L3, N)



diris-dw\_179\_a\_1\_x\_catal

#### RCM ( $I_{\Delta}$ ) – 3 x 3-Ph load

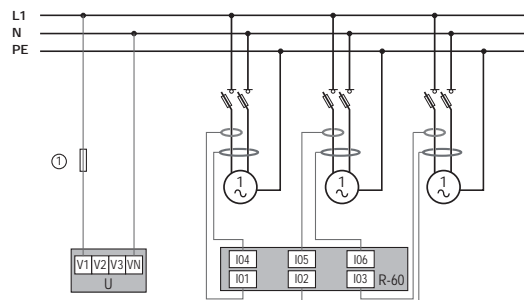
Load current monitoring – 3 x 3-Ph balanced loads



diris-dw\_180\_a\_1\_x\_catal

#### RCM ( $I_{\Delta}$ ) – 3 x 1-Ph load

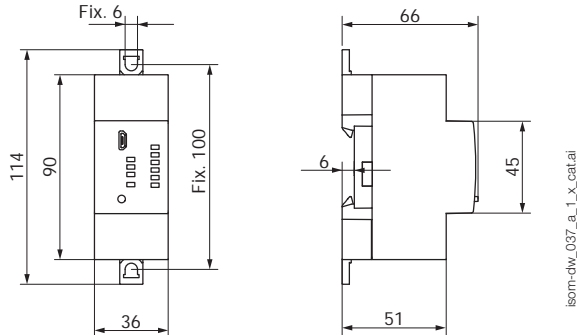
Load current monitoring – 3 x 1-Ph loads



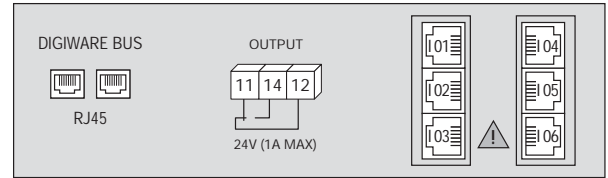
diris-dw\_181\_a\_1\_x\_catal



## Dimensions (mm)



## Terminals and wiring



**DIGIWARE BUS:** RJ45 bus to connect to other Digiware modules

**11 - 12 - 14:** alarm relay output  
**I01 - I02 - I03 - I04 - I05 - I06:** RJ12 connection of residual CTs (via the T-10 adaptor) and current sensors

## Technical characteristics

### Measurement characteristics

RCM type	Type A according to IEC 62020
Number of RJ12 channels	6
Residual CTs connection	RJ12 cables via Digiware T-10 adaptor
Current sensors connection	RJ12 cables
Current measurement accuracy	Class 0.5 according to IEC 61557-12
Active energy accuracy	Class 0.5 according to IEC 61557-12
Reactive energy accuracy	Class 1 according to IEC 61557-12

### Digital output characteristics

Number of contacts	1
Contact type	Changeover switch
Nominal voltage	24 VAC / 24 VDC
Max current	1 A
Default mode	Normally open

### Mechanical characteristics

Mounting type	DIN rail or back plate
Casing protection index	IP20
Weight	103 g

### Electrical characteristics

Auxiliary power supply	24 VDC with Digiware bus
R-60 consumption	0.5 W

### Communication characteristics

Digiware bus	
Function	Connection between Digiware modules
Cable type	Specific Socomec RJ45 cable
USB	
Protocol	Modbus RTU on USB
Function	Configuration of DIRIS Digiware modules
Cable type	Type B micro USB connector

### Environmental characteristics

Operating temperature	-10 ... +55°C
Storage temperature	-25 ... +70°C
Operating humidity	55°C / 97% RH
Operating altitude	< 2000 m

## References

Module	Reference
DIRIS Digiware R-60	4829 0114
Accessories	Reference
DIRIS Digiware T-10 RJ12 adaptor	4829 0620

RJ12 connection cables	Cable length (m)									
	0.1	0.2	0.3	0.5	1	2	3	5	10	50 m reel + 100 connectors
Number of cables	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
1	-	-	-	-	-	-	-	4829 0602	4829 0603	4829 0601
3	4829 0580	4829 0581	4829 0582	4829 0595	4829 0583	4829 0584	4829 0606	-	-	-
4	-	-	-	4829 0596	4829 0588	4829 0589	-	-	-	-
6	4829 0590	4829 0591	4829 0592	4829 0597	4829 0593	4829 0594	-	-	-	-

## Expert Services

### Require integration onto your network?

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# Residual Current Transformers – Type A

Associated with DIRIS Digiware R-60 modules

**new**



## The solution for

- > Industries
- > Data centres



## Strong points

- > A complete range
- > Optimum performances
- > High sensitivity
- > Clear alarm indication
- > Plug & play

## Compliance with standards

- > IEC 62020
- > IEC 61869-1
- > ISO 14025



## Create your project

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## Function

Residual Current Transformers enclose active conductors providing the differential summation of vector currents which enables the detection of leakage currents.

Solid core ( $\Delta IC$ , WR and TFR series) or split core ( $\Delta IP-R$ ) are adapted to all cabling configurations, for both new and existing installations.

Residual CTs can be mounted on DIN-rail, on back-plate or directly on the cable to simplifying the integration into confined spaces with high integration constraints.

The T-10 RJ12 adaptor ensures the connection of the residual CT to the DIRIS Digiware R-60 module via an RJ12 cable, available in multiple lengths.

## Advantages

### A complete range

All dimensions and types are available for compatibility with busbar or cable configurations of all dimensions, for single-phase or three-phase applications.

### Optimum performances

Thanks to a patented innovation, the conductors are perfectly centered in the residual CT to ensure accurate measurement and enhanced immunity to network interferences. It also enables direct mounting of the residual CT onto the cable.

### High sensitivity

Socomec residual CTs are able to measure leakage currents starting at 3 mA allowing to detect insulation degradations early on.

### Clear alarm indication

The T-10 RJ12 adaptor integrates an alarm LED to quickly locate RCM alarms inside electrical panels.

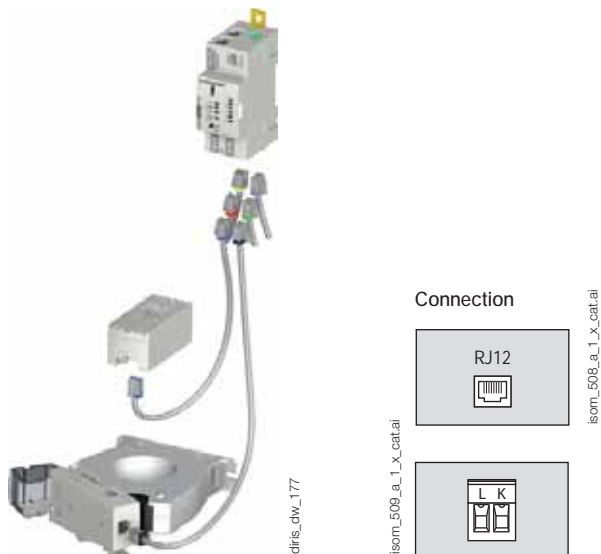
### Plug & Play

- Direct mechanical and electrical connections to the residual current transformer.
- RJ12 connection to the DIRIS Digiware R-60 for simplified integration of the Digiware system.

# Residual Current Transformers – Type A

Associated with DIRIS Digiware R-60 modules

## Connections



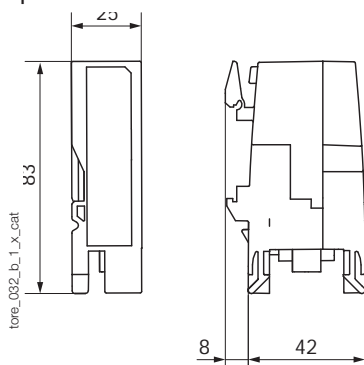
## T-10 adaptor



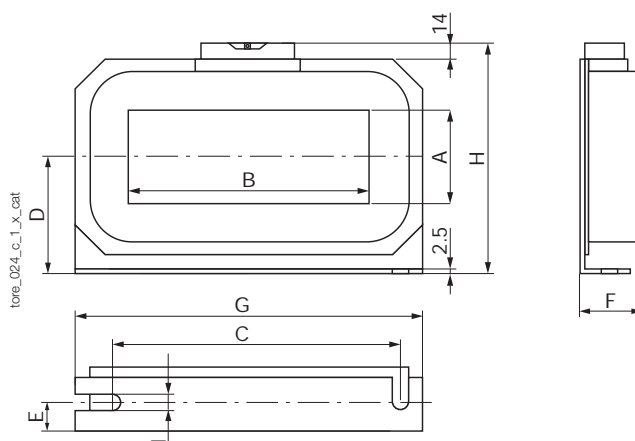
1. Clip to mechanically and electrically connect to the  $\Delta$ IC residual CT.
2. Alarm LED. Lights if the high threshold RCM alarm is active or flashes if there is a connection issue with the residual CT.
3. Connection base to the  $\Delta$ IC residual CT (supplied with 2-pin removable terminal block for remote connection).
4. DIN rail mounting clip.
5. RJ12 connection to DIRIS Digiware R-60.

## Dimensions (mm)

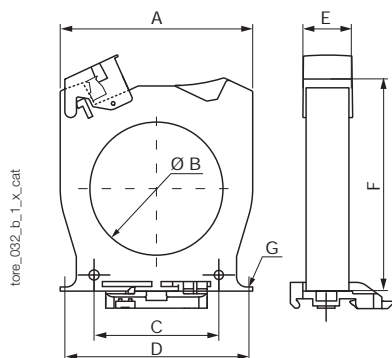
### T-10 RJ12 adaptor



### WR series solid core rectangular residual current transformers



### $\Delta$ IC solid core residual current transformers



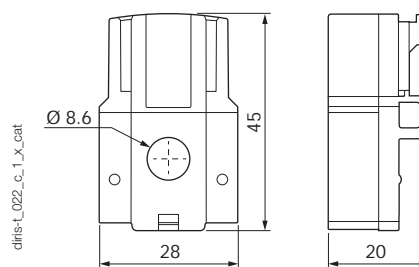
Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Weight (kg)
$\Delta$ IC $\varnothing$ 15	53	17,3	27,8	50	26	81	M4	0,10
$\Delta$ IC $\varnothing$ 30	92	30	50	85	26	103,5	M4	0,13
$\Delta$ IC $\varnothing$ 50	102,5	50	50	90	26	125	M5	0,18
$\Delta$ IC $\varnothing$ 80	116	80	75	105	26	142,5	M5	0,22
$\Delta$ IC $\varnothing$ 120	163	120	100	150	26	182,5	M6	0,38
$\Delta$ IC $\varnothing$ 200	253	200	150	175 x 41,2	51	274	M6	0,88
$\Delta$ IC $\varnothing$ 300	370	300	200	250 x 41,5	50	390	M6	1,72

- A. Width  
B. Diameter  
C. Distance between fixing centres  
D. Distance between rear fixing brackets  
E. Depth  
F. Height  
G. Diameter of fixing screws

Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	Weight (kg)
WR 70 x 175	70	175	225	85	22	46	261	176	7.5	2.9
WR 115 x 305	115	305	360	116	25	55	402	240	8	6.3
WR 150 x 350	150	350	415	140	28	55	460	285	8	8.2

- A. Window width  
B. Window length  
C. Spacers  
D. Half-height  
E. Depth of mounting spacers  
F. Depth  
G. Width  
H. Height  
I. Width of oblong fixing holes

### $\Delta$ IC $\varnothing$ 8 mm solid core residual current transformers



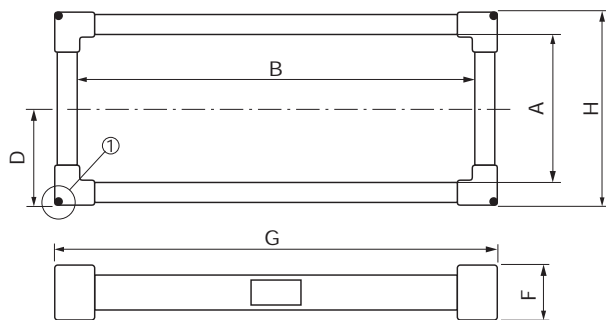


# Residual Current Transformers – Type A

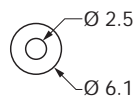
Associated with DIRIS Digiware R-60 modules

## Dimensions (mm) (continued)

TFR rectangular solid core residual current transformer



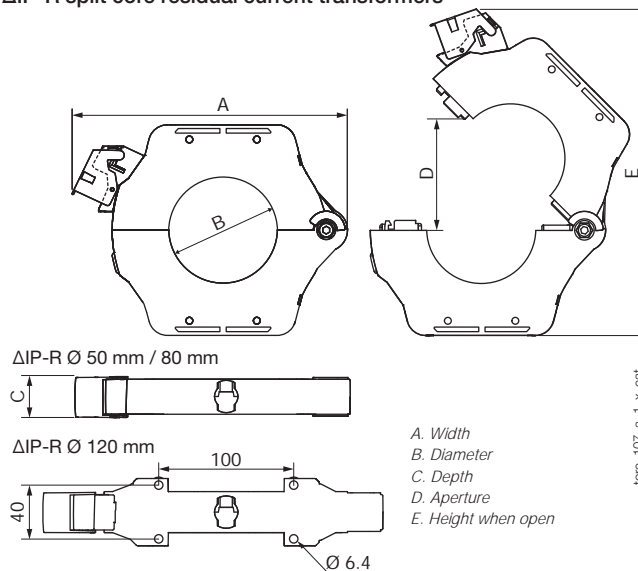
① Additional mounting details



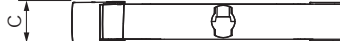
A. Window width  
B. Window length  
D. Half-height  
F. Depth  
G. Width  
H. Height

Type	A (mm)	B (mm)	D (mm)	F (mm)	G (mm)	H (mm)	Weight (kg)
TFR 200 x 500	200	500	140	62	585	285	7.2

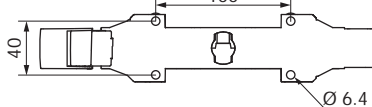
ΔIP-R split core residual current transformers



ΔIP-R Ø 50 mm / 80 mm



ΔIP-R Ø 120 mm



A. Width  
B. Diameter  
C. Depth  
D. Aperture  
E. Height when open

Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Weight (kg)
ΔIP-R Ø 50	160	49	30	77	200	
ΔIP-R Ø 80	204	79	30	108	260	0,85
ΔIP-R Ø 120	252	119	30	149	328	1,5

## Accessories for residual CTs



T-10 RJ12 adaptor for residual current transformers	Reference
T-10	4829 0620

The T-10 adaptor can be mounted directly on ΔIC residual CTs, for diameters > 30 mm, and ΔIP-R residual CTs.



Flexible cable centering accessory	Ø (mm)	Reference
Flexible cable centering accessory	30	4950 0011
Flexible cable centering accessory	50	4950 0012
Flexible cable centering accessory	80	4950 0013
Flexible cable centering accessory	120	4950 0014

Only for ΔIC and ΔIP-R.



Metal mounting bracket	Ø (mm)	Reference
Metal mounting bracket	30	4950 0001
Metal mounting bracket	50	4950 0002
Metal mounting bracket	80	4950 0003
Metal mounting bracket	120	4950 0003
Metal mounting bracket	200	4950 0004
Metal mounting bracket	300	4950 0005

Only for ΔIC and ΔIP-R.



Screw-in/out terminal block	Reference
Screw-in/out terminal block (provided with ΔIC and ΔIP-R)	4950 0041

Only for ΔIC and ΔIP-R.



DIN-rail clip	Reference
DIN-rail clip (provided with ΔIP-R)	4950 0031

Only for ΔIC and ΔIP-R.

# Residual Current Transformers – Type A

Associated with DIRIS Digiware R-60 modules

## Technical characteristics

General characteristics	$\Delta IC \text{ } \varnothing 8 \text{ mm}$	$\Delta IC \text{ } \varnothing 15 - 300 \text{ mm}$	$\Delta IP-R \text{ series}$	WR & TFR series
RCM type IEC 62020	Type A			
Connection type	Socomec RJ12 cables	Socomec RJ12 cables via T-10 adaptor		
<b>Electrical characteristics</b>				
Insulation coordination	According to IEC 60664-1			
Measurement range	3 mA - 3A			
Accuracy class	1	3		5
Winding ratio	200 / 1	600 / 1		
Max. operating voltage	300 VAC	720 VAC	720 VAC	690 VAC
Rated impulse voltage	6.4 kV	8 kV		
Rated withstand voltage	3 kV			
Operating temperature	-10 ... +55 °C	-40 ... +80 °C	-40 ... +80 °C	-10 ... +55 °C
Flammability class	UL94V-0			

## References

$\Delta IC^{(1)}$ solid core residual CTs	$\varnothing$ (mm)	Reference
$\Delta IC \text{ } \varnothing 8$	8	4829 0520
$\Delta IC \text{ } \varnothing 15$	15	4950 6015
$\Delta IC \text{ } \varnothing 30$	30	4950 6030
$\Delta IC \text{ } \varnothing 50$	50	4950 6050
$\Delta IC \text{ } \varnothing 80$	80	4950 6080
$\Delta IC \text{ } \varnothing 120$	120	4950 6120
$\Delta IC \text{ } \varnothing 200$	200	4950 6200
$\Delta IC \text{ } \varnothing 300$	300	4950 6300

WR and TFR-series rectangular solid core residual CTs	$\varnothing$ (mm)	Reference
WR 70 x 175	70 x 175	4795 0717
WR 115 x 305	115 x 305	4795 1130
WR 150 x 350	150 x 350	4795 1535
TFR 200 x 500	200 x 500	4795 2050

$\Delta IP-R^{(1)}$ series split core residual CTs	$\varnothing$ (mm)	Reference
$\Delta IP-R \text{ } \varnothing 50$	50	4750 6051
$\Delta IP-R \text{ } \varnothing 80$	80	4750 6081
$\Delta IP-R \text{ } \varnothing 120$	120	4750 6121

(1)  $\Delta IC$  and  $\Delta IP-R$  residual CTs come with a sealable protective cover, a push-in terminal block (except 15mm with fixed terminal block and without cover), and a DIN rail mounting accessory for diameters below 200 mm.

RJ12 connection cables	Cable length (m)									
	0.1	0.2	0.3	0.5	1	2	3	5	10	50 m reel + 100 connectors
Number of cables	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
1	-	-	-	-	-	-	-	4829 0602	4829 0603	4829 0601
3	4829 0580	4829 0581	4829 0582	4829 0595	4829 0583	4829 0584	4829 0606	-	-	-
4	-	-	-	4829 0596	4829 0588	4829 0589	-	-	-	-
6	4829 0590	4829 0591	4829 0592	4829 0597	4829 0593	4829 0594	-	-	-	-

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