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Installation, Operation, and Maintenance Manual

892472_15.0

MiniCAS II

FLYGT
a xylem brand

Table of Contents

1 Introduction and Safety

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1.1 Introduction

CAUTION:

- Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.
- In addition to these instructions, also pay attention to universal safety and accident prevention regulations.
- Save this manual for future reference, and keep it readily available at the location of the system controller.

Purpose of this manual

The purpose of this manual is to provide the necessary information for:

- Installation
- Operation
- Maintenance

1.2 Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Hazard levels

Hazard level	Indication
 **DANGER:**	A hazardous situation which, if not avoided, will result in death or serious injury
 **WARNING:**	A hazardous situation which, if not avoided, could result in death or serious injury
 **CAUTION:**	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	• A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

Electrical hazards

Electrical hazards are indicated by the following specific symbol. This symbol warns for presence of a dangerous voltage.

Electrical Hazard:

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1.3 User safety

Introduction

All government regulations, local health and safety directives must be observed.

Prevent danger due to electricity

All danger due to electricity must be avoided. Electrical connections must always be carried out in compliance with the following:

- The standard connections shown in the product documentation that is delivered together with the product
- All international, national, state, and local regulations. (For details, consult the regulations of your local electricity supplier.)

For more information about requirements, see sections dealing specifically with electrical connections.

1.4 Product warranty

Coverage

Xylem undertakes to remedy faults in products from Xylem under these conditions:

- The fault is due to defects in design, materials, or workmanship.
- The fault is reported to a Xylem representative within the warranty period.
- The product is used only under the conditions described in this manual.
- All service and repair work is done by qualified and authorized personnel. All modifications must be done by qualified technicians.
- Genuine Xylem parts are used.

Limitations

The warranty does not cover faults caused by these situations:

- Deficient maintenance
- Improper installation
- Modifications or changes to the product and installation made without consulting Xylem
- Incorrectly executed repair work
- Normal wear and tear

Xylem assumes no liability for these situations:

- Bodily injury
- Material damage
- Economic loss

Warranty claim

Xylem products are high quality products with expected reliable operation and long life. However, should the need arise for a warranty claim, then contact your Xylem representative.

1.4.1 Qualification of personnel

WARNING: Electrical Hazard

Risk of electrical shock or burn. A certified electrician must supervise all electrical work. Comply with all local codes and regulations.

All work on the product must be carried out by certified electricians or Xylem authorized mechanics.

Xylem disclaims all responsibility for work done by untrained, unauthorized personnel.

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1.4.2 Support

Xylem only supports products that have been tested and approved. Xylem does not support unapproved equipment.

2 Transportation and Storage

2.1 Inspect the delivery

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Inspect the package

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
   If the product has been picked up at a distributor, make a claim directly to the distributor.

Inspect the product

1. Remove packing materials from the product.
   Dispose of all packing materials in accordance with local regulations.
2. Inspect the product to determine if any parts are damaged or missing.
3. If applicable, unfasten the product by removing any screws, bolts, or straps.
   For your personal safety, be careful when you handle nails and straps.
4. Contact your sales representative if anything is out of order.

3 Product Description

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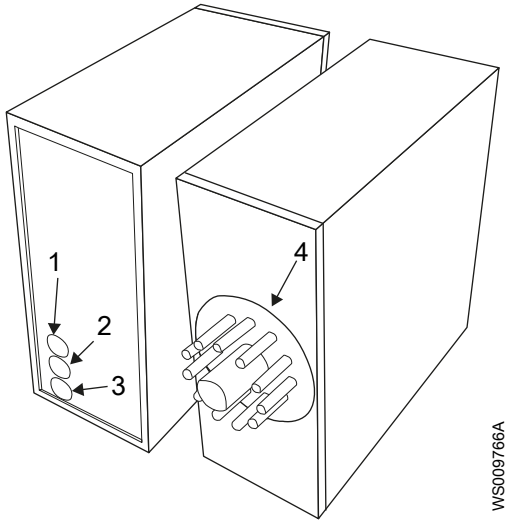
3.1 Product design

The MiniCAS II overall purpose is to protect pumps and mixers. It is a monitoring relay for temperature and leakage sensors and is made to plug into a standard 11-pin socket.

The relay monitors the following sensors:

Type	Description
Thermal contact	Temperature sensor for detection of high temperature in the stator winding
FLS	Float switch for leakage detection in pumps and mixers
FLS10	Float switch for leakage detection in the inspection chamber
CLS	Water-in-oil sensor for detection of excessive water in the oil chamber

3.2 Parts



1. **LEAKAGE** LED
2. **TEMPERATURE** LED
3. **SUPPLY** LED
4. 11–pin contact

3.3 Approvals

MiniCAS II Version	Part No.	Approval
24 V AC/DC	83 58 57	CE, UR, CSA
120 V AC	40–50 10 98	CE, UR, CSA
230 V AC	40–50 15 60	CE

4 Installation

4.1 Precautions

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Before starting work, make sure that the safety instructions have been read and understood.

DANGER: Electrical Hazard

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.

DANGER: Electrical Hazard

All electrical equipment must be grounded (earthed). Test the ground (earth) lead to verify that it is connected correctly and that the path to ground is continuous.

WARNING: Electrical Hazard

Risk of electrical shock or burn. A certified electrician must supervise all electrical work. Comply with all local codes and regulations.

WARNING: Electrical Hazard

There is a risk of electrical shock or explosion if the electrical connections are not correctly carried out, or if there is fault or damage on the product. Visually inspect equipment for damaged cables, cracked casings or other signs of damage. Make sure that electrical connections have been correctly made.

CAUTION: Electrical Hazard

Prevent cables from becoming sharply bent or damaged.

4.2 External switch

This product cannot be used as an emergency stop device.

An external switch or circuit breaker must be provided near the installation, to enable the connected machinery to be isolated from the power supply.

4.3 Do not install in an explosive zone

NOTICE:

Do not use this unit in environments that may contain flammable/explosive or chemically aggressive gases or powders.

4.4 Connect the MiniCAS II

An 11–pin socket must be installed in the pump control panel.

The MiniCAS II is used in one of two ways:

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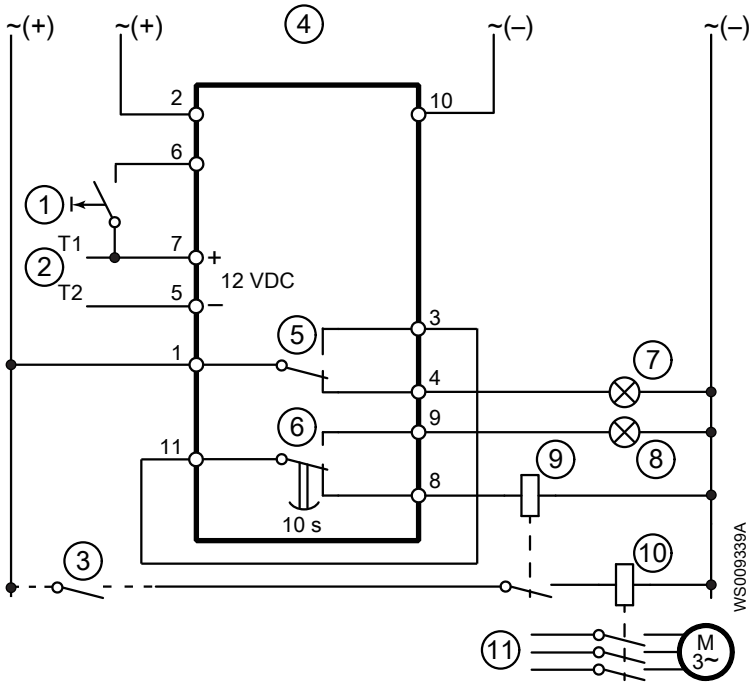
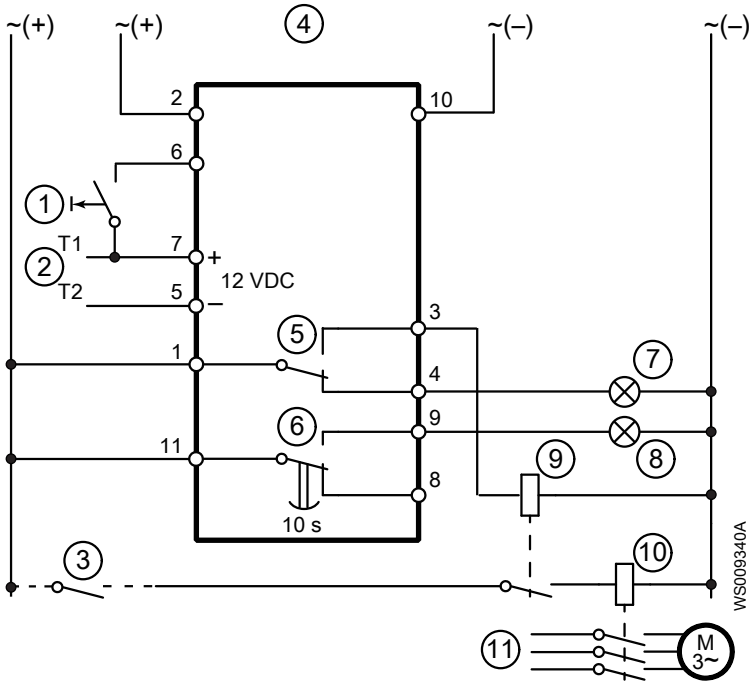
- Both overtemperature and leakage alarms stop the pump
- Overtemperature alarm stops the pump and leakage alarm is only indicated.

1. Connect the wires to the 11–pin socket terminals according to the applicable diagram. See *Terminals* on page 15.
   – Overtemperature and leakage stop the pump



   – Overtemperature stops the pump and leakage is only indicated



Position	Description
1	Alarm reset
2	Sensor circuit
3	Start and stop by a pump controller
4	Power supply

Position	Description
5	High temperature relay
6	Leakage detection relay
7	High stator temperature alarm lamp
8	Leakage alarm lamp
9	Auxiliary relay
10	Pump contactor
11	Pump main supply

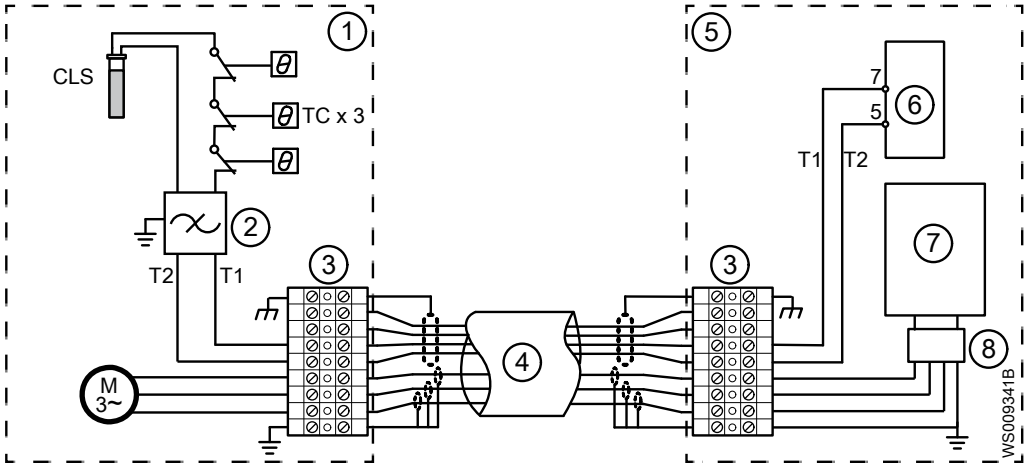
2. Insert the MiniCAS II into the 11–pin socket.

4.5 Prevent interference from a variable frequency drive

Interference from a variable frequency drive (VFD) can cause nuisance tripping of the CLS sensor.

1. Connect a filter between the sensor and the terminal block in the junction box, see *Filter kits* on page 18 and *Filter connection diagrams* on page 17.

   Usually with VFD and CLS, this filter is preinstalled.



1. Pump with junction box
2. Filter
3. Terminal block
4. Screened SUBCAB® cable
5. Control panel
6. MiniCAS II
7. VFD
8. EMC filter

2. Connect the cable to the control panel.

   Do not exceed 40 m (130 ft) due to the occurrence of harmonic distortion.

3. Connect an EMC filter between the VFD output and the control panel.

4.6 Check the sensor output current

1. Connect a multimeter in series with the sensor circuit.

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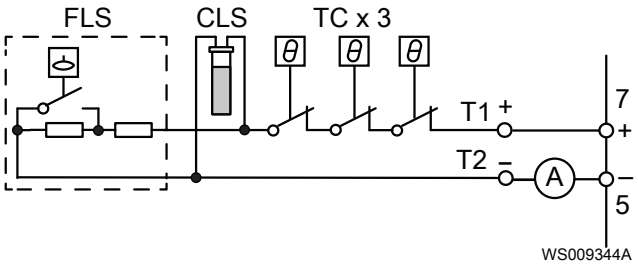

2. Make sure that the measured values correspond to the applicable sensor combination values.
3. See *Sensor combinations* on page 16 for the no fault values.

5 Operation

5.1 The current levels for alarm lights

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When the current level is between 3–22 mA, it is only the **SUPPLY** LED that is lit.

Current level (mA)	Type of alarm
> 22	Leakage alarm
< 3	Overtemperature alarm

5.2 LED indications

Symptom	Cause	Remedy
The leakage indicator LED is lit.	There is a leakage in the pump.	Service the pump. For information, see *Check which sensor tripped the leakage alarm* on page 12.
	There is an earth fault in the sensor circuit wiring.	See *Check for an earth fault in the sensor circuit* on page 12 .
The temperature indicator LED is lit.	A thermal contact is open.	Service the pump.
	The CLS is connected with the wrong polarity in series with the temperature switches.	Change polarity on the sensor output of the relay.
The sensor output voltage is low.	There is an earth fault in the sensor circuit wiring.	See *Check for an earth fault in the sensor circuit* on page 12.
	The relay has a fault.	Replace the relay.
The leakage indicator is nuisance tripping.	The drive unit has CLS and VFD, and is not protected by a filter.	Install a filter in the drive units junction box, see *Filter kits* on page 18
	The drive unit has a CLS and no VFD, but the fault is due to interference from other drive units.	Install a filter on the sensor output of the relay.

5.3 Reset the alarms after a fault indication

After a leakage fault, the relay resets automatically.

After an overtemperature fault, the relay requires a manual reset.

Select one of the following steps to reset the relay:

- Push the external push-button that is connected to pin 6 and pin 7.
  When using the 24 V relay, pin 6 and pin 2 also resets.
- Interrupt the power supply for a short while.

6 Troubleshooting

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6.1 Precautions

Before starting work, make sure that the safety instructions have been read and understood.

DANGER: Electrical Hazard

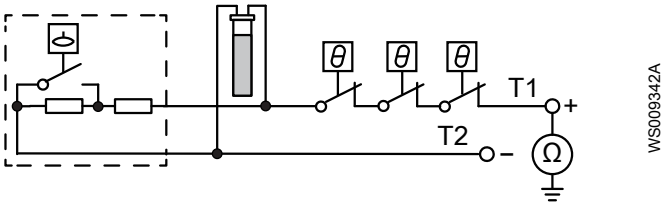
Troubleshooting a live control panel exposes personnel to hazardous voltages. Electrical troubleshooting must be done by a qualified electrician.

DANGER: Electrical Hazard

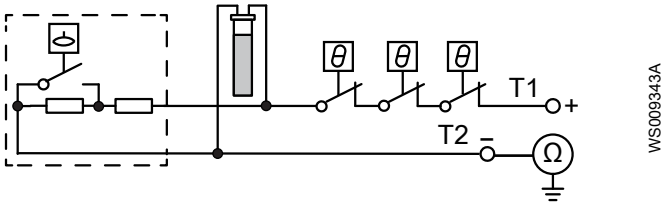
Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.

6.2 Check for an earth fault in the sensor circuit

1. Measure the resistance between the T1 wire and the ground (earth) by using a multimeter.



2. Measure the resistance between the T2 wire and the ground (earth) by using a multimeter.



3. When the value is lower than one megaohm, inspect the circuit wiring in the pump.

   A lower value indicates an earth fault.

6.3 Check which sensor tripped the leakage alarm

The sensor circuit has a CLS and FLS connected.

1. Select one of the following steps to disconnect the power to the relay:

Condition	Action
No pump runs.	Switch off the power to the control panel and switch it back on.
The second pump in a dual pumping station runs.	Pull out the relay from the socket and insert it back.

2. Measure the time for the leakage alarm to trip from the moment the relay is powered.

Delay time	Sensor tripping the alarm
10 s	FLS
15 s	CLS

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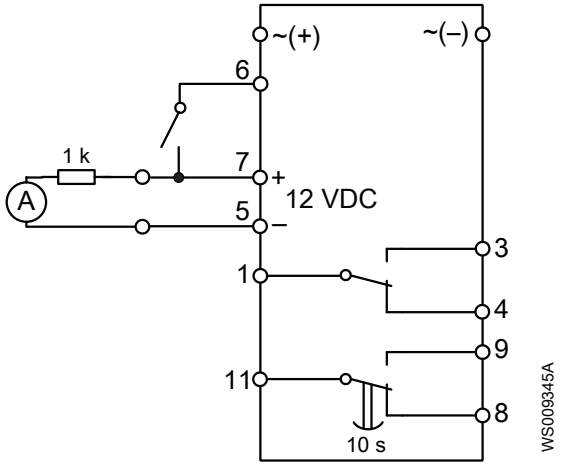
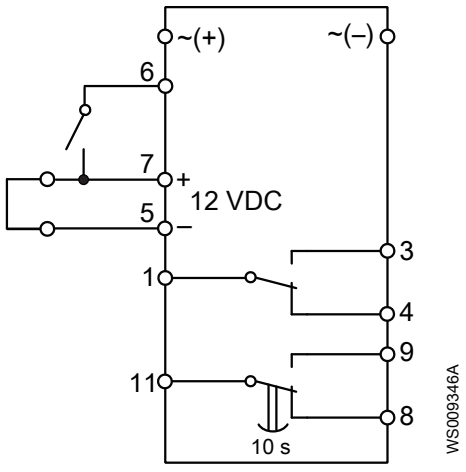
6.4 Test the function of the relay

1. Simulate a normal condition.
   a) Connect a 1 kilohm resistor in series with an ammeter to the sensor output.
   b) Connect terminal 6 and 7 to reset the relay.



   Only the supply LED lights up and the meter shows 12 mA if the condition is normal.
2. Simulate the temperature alarm.
   a) Disconnect the resistor.
      The temperature LED is lit.
   b) Reconnect the resistor.
      The temperature LED is still lit.
   c) Connect terminal 6 and 7 for a short while to reset the relay.
      The temperature LED is turned off.
3. Simulate the leakage alarm.
   a) Connect a lead between terminal 5 and 7.



      This short circuit does not damage the unit.
   b) Keep the short circuit closed for 10 s.
      The leakage LED is lit.
   c) Remove the lead between terminal 5 and 7.

The leakage LED is turned of.

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7 Technical Reference

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7.1 Dimensions

Parameter	Value mm (in)
(W×H×D)	33×79×75 (1.29×3.11×2.95)

7.2 Environmental requirements

Parameter	Value
Temperature	-25˚ C – +60˚ C
Operating humidity	Relative humidity, non-condensing: 90%

7.3 Electrical data

Version	24 VDC	24 VAC	120 VAC	230 VAC
Supply voltage	24	24	120	230
Supply voltage tolerance	-2%–25%	-17%–25%,	±15%	
Frequency	-	50–60 Hz		
Relay resistive contact rating	24 VDC, 250 VAC, 5 A			
Relay inductive contact rating	24 VDC, 250 VAC, 2 A			
Sensor output voltage	12 VDC, ±5%			
Required power supply	5 W			

7.4 Terminals

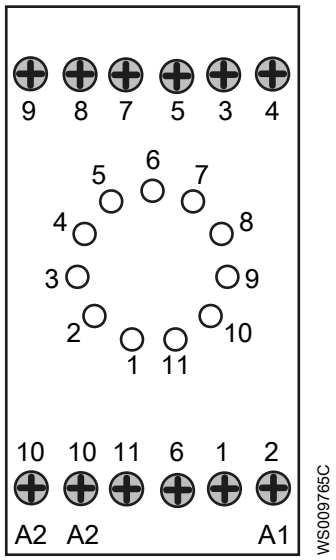

Figure 1: Example of screw-terminal configuration of an 11-pin relay base

1. Temperature relay: Common
2. Power supply, 24 V AC/DC (+)
3. Temperature relay: Interlock and power on, 1–3 closed
4. Temperature relay: Alarm and power off, 1–4 closed
5. Output to sensors: 12 VDC (-), T2
6. External reset of temperature alarm: Resilient pushbutton, 6–7
7. Output to sensors: 12 VDC (+), T1
8. Leakage relay: Interlock, 1–8 closed
9. Leakage relay: Alarm, 1–9 closed
10. Power supply, 24 V AC/DC (-)
11. Leakage relay: Common

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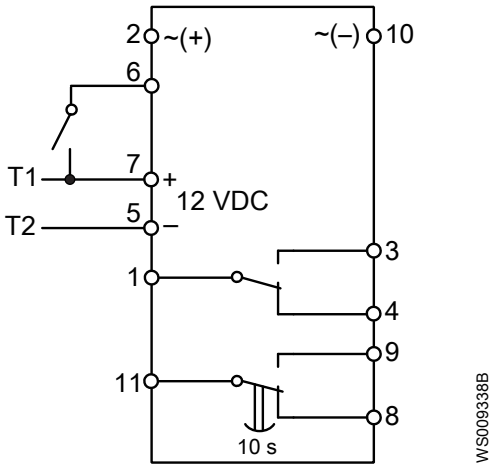
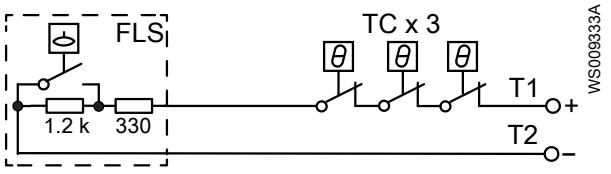
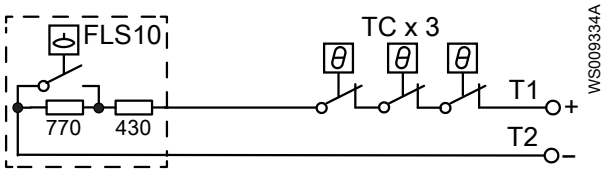
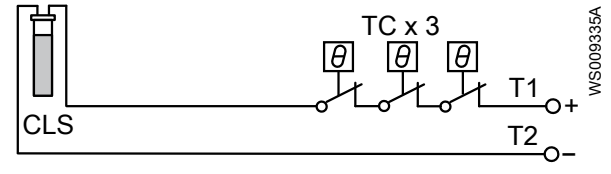
7.5 Circuit functions

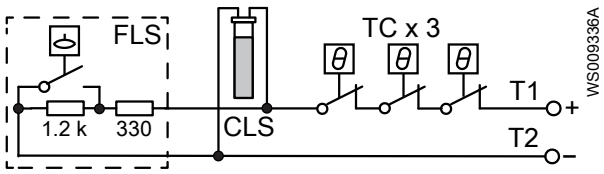
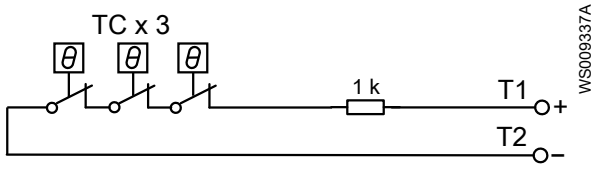


MiniCAS II terminals	Description
1–3	Normal temperature
1–4	Overtemperature
2–10	Power supply: 24 V AC/DC, 120 VAC, or 230 VAC
5–7	Current from sensors measured at 12 VDC output
6–7	Alarm reset
11–8	No leakage
11–9	Leakage

7.6 Sensor combinations

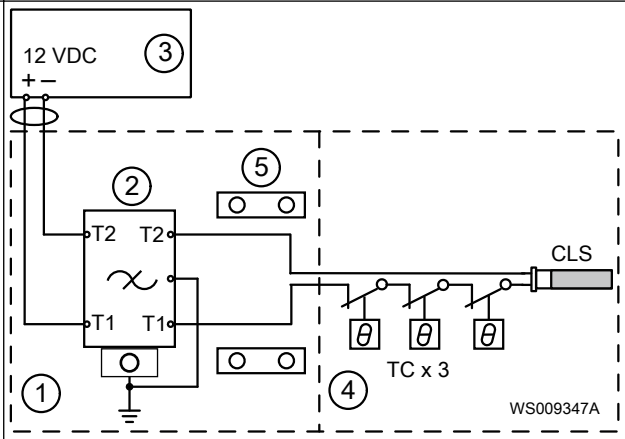
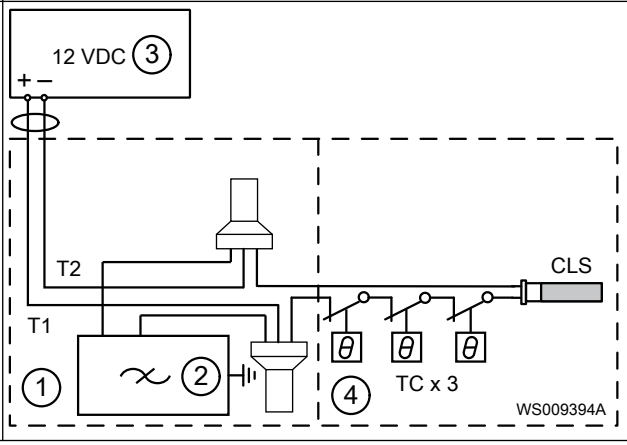
The T1 and T2 wires are connected to the sensor input of the relay. Overtemperature always results in 0 mA sensor output current. The value of the current can vary within 10%.

Combination	Configuration	No fault (mA)	Leakage (mA)
FLS Thermal contacts		7.8	36
FLS10 Thermal contacts		10	28
CLS Thermal contacts	 CLS must be connected with the correct polarity: brown = + and black = –.	5.5	29

Combination	Configuration	No fault (mA)	Leakage (mA)
FLS CLS Thermal contacts	 CLS must be connected with the correct polarity: brown = + and black = –.	13.3	36–42
Thermal contacts 1 kilohm resistor		12	-

7.7 Filter connection diagrams

1. Junction box
2. Filter
3. MiniCAS II
4. Sensor circuit
5. Connection terminals to be removed when using a filter

Filter kit part number	Connection diagram
604 68 00	
604 68 01	

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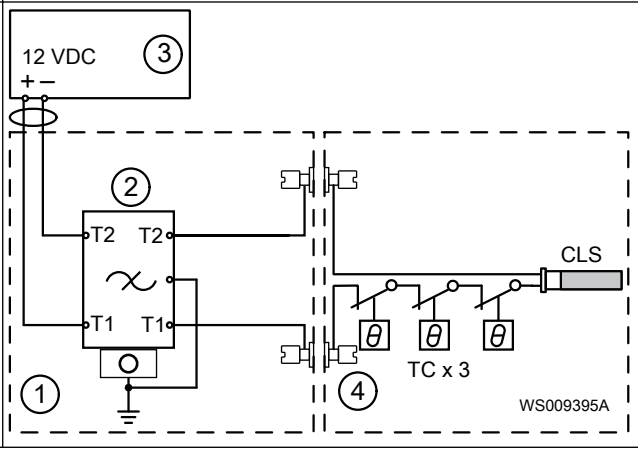
Filter kit part number	Connection diagram
604 68 02 604 68 04 661 60 00 661 60 01	

7.8 Filter kits

Drive unit	Part.no
3102, 3127, 4430	6046800
3085, 4410	6046801
3140, 3152, 3170, 3201, 3300	6046802
3231, 3306, 3312, 3351, 3356, 3400, 3501, 3602, 3800, 7045, 7061, 7081, 7101, 7115, 7121, 7125	6046804
4630, 4640, 4650, 4660	6616000
4670, 4680	6616001

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1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We’re a global team unified in a common purpose: creating advanced technology solutions to the world’s water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

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