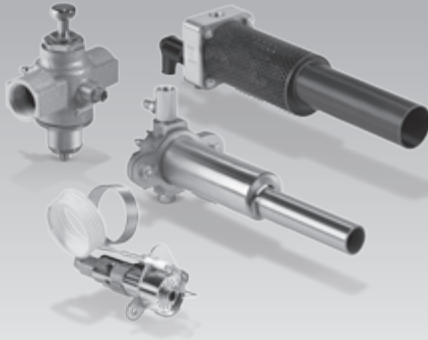


Operating instructions

Control valves S11T, Gas pilots ZTA, ZT 40, ZTI 55



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Safety

Please read and keep in a safe place



Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

Explanation of symbols

 **1, 2, 3**... = Action
 = Instruction

Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

DANGER

Indicates potentially fatal situations.

WARNING

Indicates possible danger to life and limb.

! CAUTION

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

Changes to edition 03.16

The following chapters have been changed:

- Installation
- Certification

Checking the usage

Gas pilots

For safe ignition and, in conjunction with control valve S11T, for thermo-electric safeguarding of gas burners. With spark electrode for electrical ignition in conjunction with an ignition transformer. Suitable for operation with natural gas, coke oven gas or LPG. This function is only guaranteed when used within the specified limits—see also page 10 (Technical data). Any other use is considered as non-compliant. Order number and gas type: see type label.

D-Osnabrück Germany



ZT [redacted]

8 [redacted]

Gas [redacted]

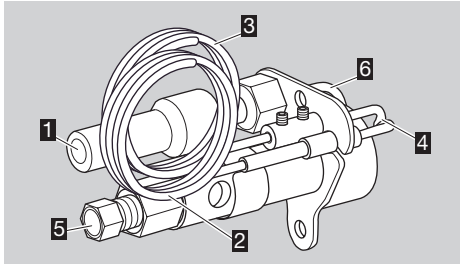
ZTA

Type code

Code	Description
ZTA	Thermo pilot with spark electrode Suitable for operation with: natural gas, town gas*
B	natural gas
G	LPG

* For operation with town gas, replace the gas nozzle – see page 9 (Accessories).

Part designations



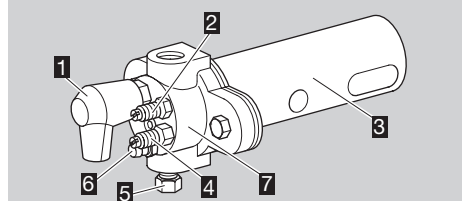
- 1 Spark plug for spark electrode
- 2 Thermo-cable
- 3 Grounding cable
- 4 Thermocouple
- 5 Gas connection flange with cap screw and double-cone olive
- 6 Spark electrode

ZT 40

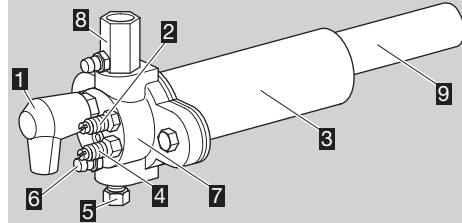
Type code

Code	Description
ZT 40	Thermo pilot with protective tube Suitable for operation with: natural gas town gas LPG
200	Protective tube length [mm]
/100	Flame tube length [mm]
A	Atmospheric

Part designations



ZT 40..A



ZT 40../100

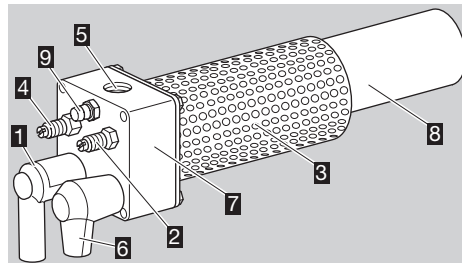
- 1 Right-angle terminal boot for spark electrode
- 2 Connection for thermo-cable
- 3 Protective tube
- 4 Connection for grounding cable
- 5 Gas connection with cap screw and double-cone olive
- 6 Gas pressure tap
- 7 Burner body
- 8 Air nozzle with pressure tap and Rp 1/4" connection for air supply line
- 9 Flame tube

ZTI 55

Type code

Code	Description
ZTI 55	Thermo pilot with flame rod Suitable for operation with: natural gas town gas LPG
105	Protective tube length [mm]
/120	Flame tube length [mm]
A	Atmospheric

Part designations



- 1 Interference-suppressed right-angle terminal boot for spark electrode
- 2 Connection for thermo-cable
- 3 Protective tube

- 4 Connection for grounding cable
- 5 Rp 1/4 gas connection
- 6 Right-angle terminal boot for flame rod
- 7 Burner body
- 8 Flame tube
- 9 Gas pressure tap

Control valve S11T

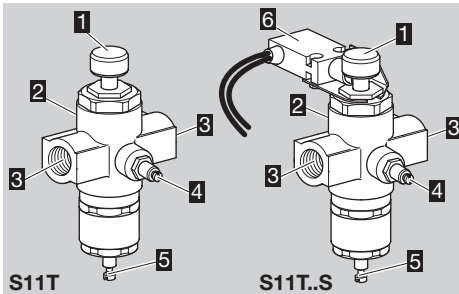
For thermo-electric safeguarding of gas-fired installations of any kind in conjunction with thermo pilots ZTA, ZT 40 or ZTI. Control valve S11T operates independently of mains power supply.

Control valve S11T..S is fitted with a switch to control an ignition transformer.

Type code

Code	Description
S11T	Control valve
	Nominal size [DN]:
15	15
20	20
25	25
R	Rp internal thread
	Max. inlet pressure p_U :
01	100 mbar
15	1500 mbar
S	With switch

Part designations



- 1 Gas supply start button
- 2 Pilot gas connection
- 3 Main gas connection
- 4 Connection for grounding cable
- 5 Connection for thermo-cable
- 6 Ignition transformer On/Off switch

Installation

⚠ DANGER

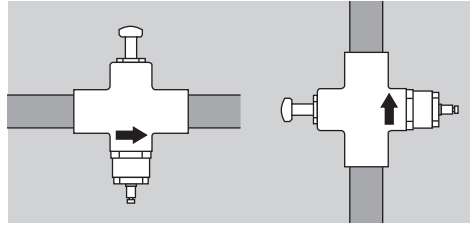
Risk of explosion! Ensure the connection is gas-tight.

⚠ CAUTION

Dropping the device can cause permanent damage. In this event, replace the entire device and associated modules before use.

Control valve

- ▷ Installation position: the button for activating the valve must point upwards or to the side. It must not point downwards. Note the flow direction – see arrow on housing.



- ▷ The control valve must not be in contact with masonry. Minimum clearance 20 mm.
- ▷ The pilot gas connection and the grounding cable connection can be interchanged if the installation position requires it.
- ▷ Sealing material and thread cuttings must not be allowed to get into the valve housing.

1 Remove the screw caps from the main gas connection.

2 Install the control valve in the pipe.

Gas pilot

- ▷ Install the pilot so that reliable ignition of the main burner is guaranteed.
- ▷ Attach the pilot securely.
- ▷ We recommend that a filter be installed in the gas and air supply line respectively.
- ▷ The thermocouples at the pilot head must not come into contact with the main burner flame.
- ▷ ZTA, ZT 40..A, ZTI 55: ensure the air supply is not obstructed.
- ▷ Gas types and gas pressures:

Burner	Operation with	Gas pressure [mbar]	P_{rated} [kW]
ZTA	Natural gas	12 – 40*	1
	LPG	12 – 40*	1
	Town gas**	20 – 40*	1
ZT 40..A	Natural gas	20 – 35*	1
	LPG	40 – 60*	1
	Town gas	12 – 28*	1
ZT 40../100	Natural gas	20 – 40*	1
	LPG	40 – 60*	1
	Town gas	12 – 28*	1
ZTI 55	Natural gas	12 – 50	3,3
	LPG	12 – 50	2,5
	Town gas	20 – 60	2,3

* In the case of higher gas pressures, fit a gas restrictor orifice – see page 9 (Accessories).

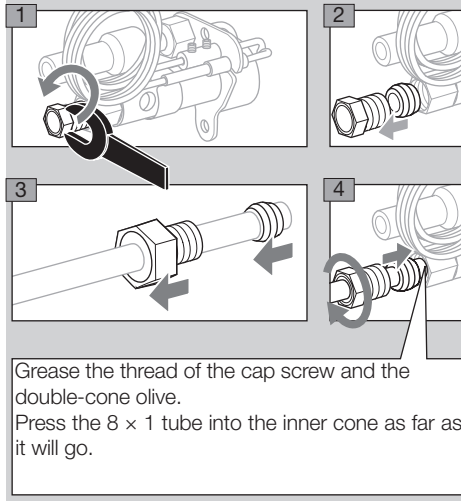
** Replacing the burner nozzle, see page 9 (Accessories).

Connecting the pilot gas supply line

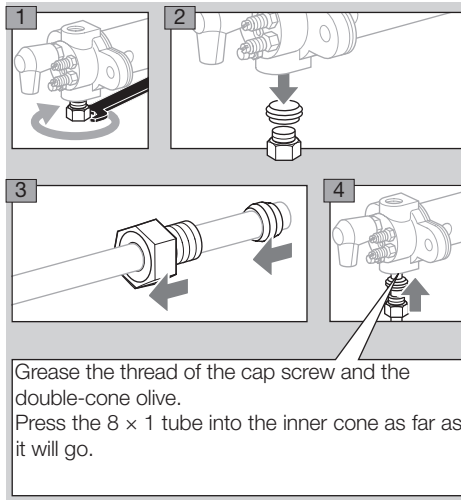
ZTA, ZT 40

- ▷ Connect pilot and control valve using an 8 × 1 tube.

ZTA



ZT 40



ZTA, ZT 40

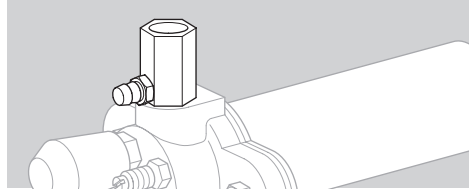
- 5 Tighten the cap screw.

ZTI 55

- ▷ Rp 1/4 gas connection.

Connecting the air supply line on ZT 40../100

- ▷ In the air connection there is an integrated air nozzle with an Rp 1/4" connection for air supply pressures ≥ 10 mbar.



- ▷ For air supply pressures ≤ 10 mbar, unscrew the air nozzle from the air connection and screw the air supply line directly into the air connection (Rp 1/4").
- ▷ For adjusting to air supply pressures ≥ 10 mbar, we recommend fitting an adjusting cock with R 1/4 connection upstream of the air nozzle, e.g. GEH 8.
- ▷ In the case of air supply pressures > 800 mbar, we recommend additionally inserting an air restrictor orifice upstream of the adjusting cock – see page 9 (Accessories).

Wiring

⚠ DANGER

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

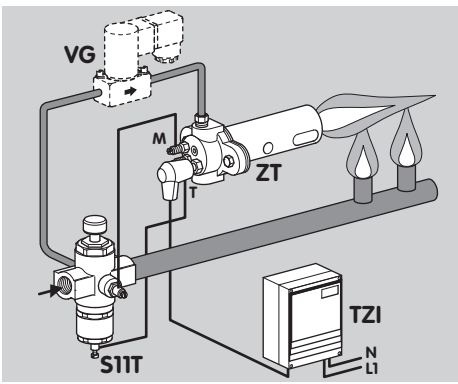
Control valve

- ▷ A solenoid valve VG 6 can be used as an additional safety valve.
- ▷ Use copper cable with a suitable cross-section for transferring the thermo-electric voltage and for grounding – see page 9 (Accessories).

Cable length	Cable cross-section	Diameter
3 m	6 mm ²	2.9 mm

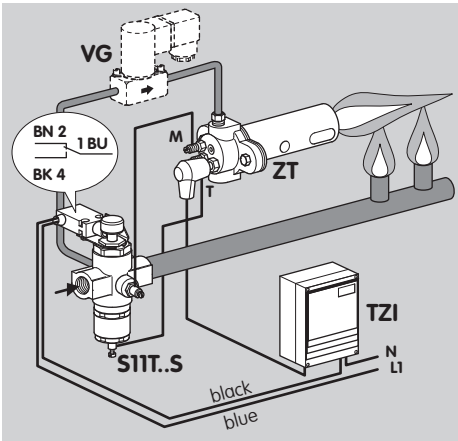
- ▷ ZTA: the grounding cable and thermo-cable are already fitted on the pilot.

- 1 Connect thermo-cable and grounding cable.
- ▷ **M** = grounding cable connection, **T** = thermo-cable connection.



S11T.S

- 2 Connect the cables from the ignition transformer to the ignition transformer in accordance with local regulations.



Gas pilot

- ▷ Wire the ignition cable as shown in the connection diagrams of the ignition transformer.
 - ▷ Length of ignition cable:
 - max. 5 m (15 ft),
 - < 1 m (40 inch) recommended.
 - For permanent ignition max. 1 m (40 in).
 - ▷ Lay the ignition cable individually and not in a metal conduit.
 - ▷ ZTA: carefully unwind the thermo-cable, then connect it. Avoid mechanical stress at the welding spot between the thermocouple and the thermo-cable.
 - ▷ ZTI 55: install the ignition cable separately from the ionization cable.
- 1 Remove the right-angle terminal boot from the burner.
 - 2 Screw the ignition cable securely into the right-angle terminal boot.
- ▷ For the ignition cable, use an unscreened high-voltage cable – see page 9 (High-voltage cable):

- 3 Replace the right-angle terminal boot.

Commissioning

⚠ DANGER

Risk of explosion! Please observe the appropriate precautions when igniting the burners.

Risk of poisoning! Open the gas and air supply so that the burner is always operated with excess air – otherwise CO will form in the furnace chamber. CO is odourless and poisonous! Conduct a flue gas analysis.

- ▷ Arrange the adjustment and commissioning of the burner with the system operator or manufacturer.
- ▷ Check the entire system, upstream devices and electrical connections.
- ▷ Pre-purge the furnace chamber with air (5 x furnace chamber volume) before every ignition attempt.
- ▷ Fill the gas line to the burner carefully and correctly with gas and vent it safely into the open air – do not discharge the test volume into the furnace chamber. Risk of explosion!
- ▷ If the burner does not ignite although the automatic burner control unit has been switched on and off several times: check the entire system.
- ▷ After ignition, monitor the gas and air pressures measured on the burner and the flame. Control valve switch-off threshold, see page 10 (Technical data).

- 1 Check for tightness, see page 6 (Tightness test).

- 2 Switch on the system.

- 3 Open the gas supply.

- 4 Press the control valve button and hold down.

- 4 Electrically ignite the pilot.

- ▷ Once the pilot flame is burning, hold the control valve button for at least 30 s until the thermo-electric voltage has built up and keeps the control valve open.
- 5 Release the control valve button.
- ▷ The main gas line on the control valve is opened.
- ▷ If the main burner is not ignited by the pilot, shut off the main gas supply immediately.

Checking the switch-off time

- 6 Close the gas supply.

- ▷ Once the pilot flame has gone out, the control valve must shut off the main gas supply after 30 s ("click").
- ▷ If the main gas supply remains open after 30 s, this may be caused by too high a temperature on the thermocouple. Check and correct the alignment and the distance between pilot and main burner.

⚠ DANGER

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

Risk of burning! Dismantled burner components can be hot due to outflowing flue gases.

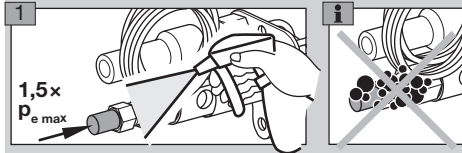
- ▷ If the error still occurs: remove the unit and return it to the manufacturer for inspection.

Tightness test

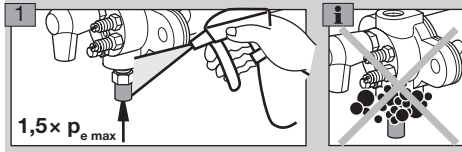
⚠ DANGER

Risk of explosion and poisoning! To ensure that there is no danger resulting from a leak, check the gas connections on the burner for leaks immediately after the burner has been put into operation.

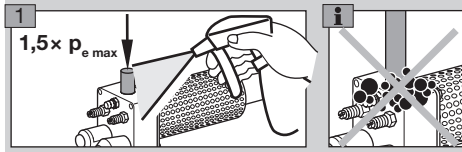
ZTA



ZT 40



ZTI



Setting the gas/air mixture

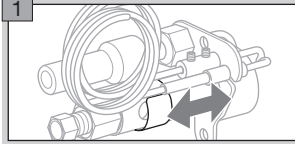
- ▷ In cases where the pilot flame is too small or too large, the gas/air mixture can be adjusted using the air slide valve.
- ▷ Burner diagrams – see www.docuthek.com, Type of document: “Operating characteristic diagrams”.
- Switch off the burner.

⚠ DANGER

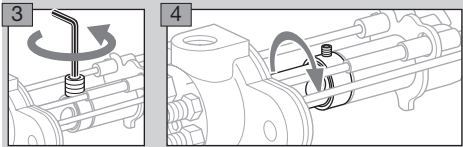
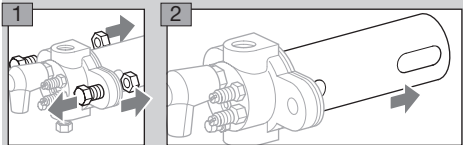
Risk of burning! Dismantled burner components can be hot due to outflowing flue gases.

Risk of explosion and poisoning in case of burner adjustment with an air deficiency! Adjust the gas and air supply so that the burner is always operated with excess air – otherwise CO will form in the furnace chamber. CO is odourless and poisonous! Conduct a flue gas analysis.

ZTA

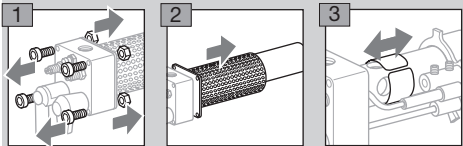


ZT 40



- 5 Retighten the grub screw on the air slide valve.

ZTI 55

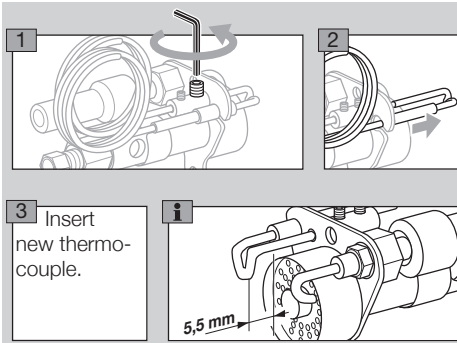


ZT 40, ZTI 55

- Follow the reverse procedure when reassembling.
- ▷ Replace the seal between burner body and protective tube.
- Restart the burner.
- Check the thermo-electric voltage – see page 8 (Maintenance).

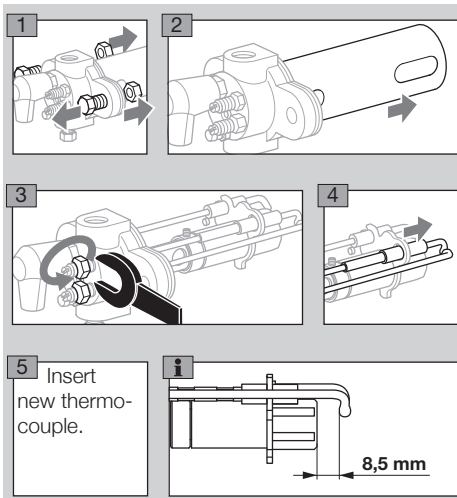
Replacing the thermocouple

ZTA

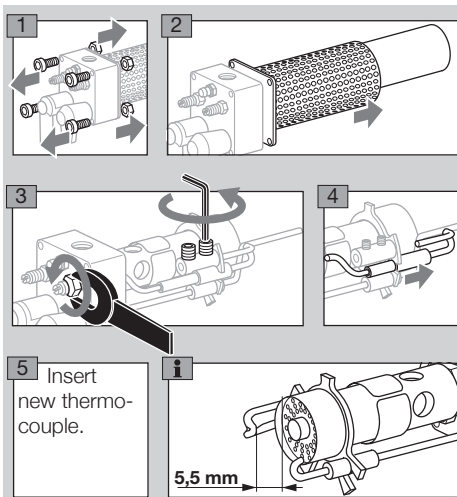


3 Follow the reverse procedure when reassembling.

ZT 40



ZTI 55

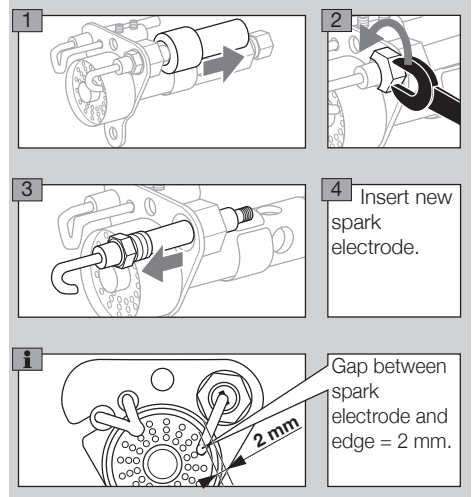


ZT 40, ZTI 55

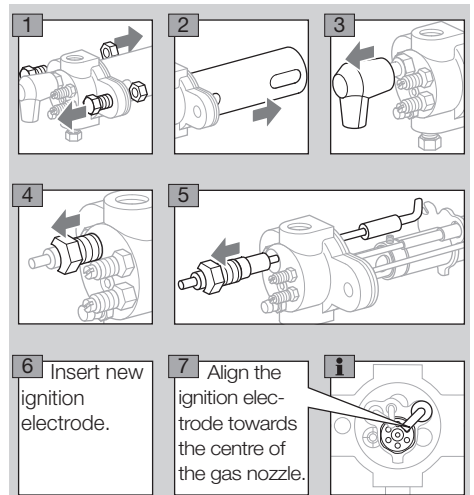
- 5** Follow the reverse procedure when reassembling.
- ▷ Replace the seal between burner body and protective tube.

Replacing the spark electrode

ZTA

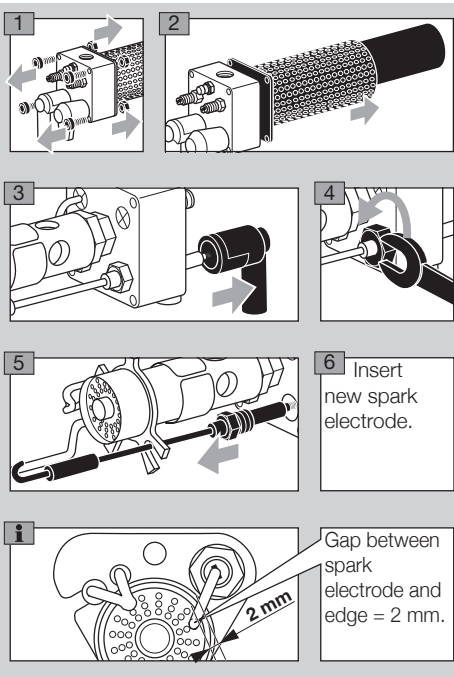


ZT 40



- 6** Insert new ignition electrode.
 - 7** Align the ignition electrode towards the centre of the gas nozzle.
- ▷ Distance between burner ground and spark electrode = 2 ± 0.5 mm.

ZTI 55



ZT 40, ZTI 55

- Follow the reverse procedure when reassembling.
- ▷ Replace the seal between burner body and protective tube.

Maintenance

- ▷ We recommend an annual function check.

⚠ DANGER

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

Risk of burning! Dismantled burner components can be hot due to outflowing flue gases.

Risk of explosion and poisoning in case of burner adjustment with an air deficiency! Adjust the gas and air supply so that the burner is always operated with excess air – otherwise CO will form in the furnace chamber. CO is odourless and poisonous! Conduct a flue gas analysis.

- 1 Disconnect the system from the electrical power supply.
- 2 Shut off the gas and air supply.
 - ▷ Do not change the butterfly valve settings.
- 3 Check the nozzles for dirt.
- 4 Check the switch-off time – see page 5 (Checking the switch-off time)
- 5 Check whether the thermocouple is soiled or burnt.

- ▷ Replace a burnt thermocouple, see page 7 (Replacing the thermocouple).
- 6 Check the thermo-electric voltage: when moving the air slide valve on the pilot – see page 6 (Setting the gas/air mixture) – measure the thermo-electric voltage on the control valve between the connections for the thermo-cable and the grounding cable.
 - ▷ The thermo-electric voltage on the control valve with respect to ground must be ≥ 10 mV.
 - ▷ If the thermo-electric voltage on the control valve is < 10 mV – see page 8 (Faults).

Faults

⚠ DANGER

Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

Fault-clearance must only be undertaken by authorized, trained personnel.

- ▷ Faults may be cleared only using the measures described below.
- ▷ If the control valve or the pilot does not respond even though all faults have been remedied: remove the unit and return it to the manufacturer for inspection.

? Faults

! Cause

• Remedy

? The pilot flame is not burning.

! No gas supply.

- Check gas pipe.

! No ignition spark.

- Check the voltage supply to the ignition transformer.

- Check the high-voltage line from the ignition transformer.

- ▷ High-voltage line too long.

- Check the distance to the spark electrode.

- ▷ Distance between burner ground and spark electrode = 2 ± 0.5 mm.

- S11T..S: check the functioning of the ignition transformer switch.

- ▷ Measure the voltage on the switch input and output with respect to N.

! Spark electrode burnt off.

- Replace the spark electrode.

? The pilot flame is too small or too large.

! Gas and air pressures are too low or too high.

- Correct the gas pressure.

- ▷ For gas pressures ≥ 30 mbar, fit a gas restrictor orifice upstream of the burner.

- ▷ ZT 40 with forced air supply: check the air pressure and correct if necessary. Fit an air restrictor orifice.
- Adjust the air slide valve – see page 6 (Setting the gas/air mixture).

? The control valve closes while the pilot is in operation.

- ! The thermo-electric voltage is too low.
- Adjust the gas/air mixture – see page 6 (Setting the gas/air mixture).
- ▷ The thermo-electric voltage on the control valve with respect to ground must be ≥ 10 mV.
- ! Thermocouple burnt.
- Replace the thermocouple – see page 7 (Replacing the thermocouple).
- ! The pilot or control valve is defective.
- ▷ If the thermo-electric voltage on the control valve is < 10 mV, loosen the thermo-cable on the control valve.
- Measure the thermo-electric voltage on the pilot with respect to ground.
- ▷ If the thermo-electric voltage on the pilot < 20 mV: The pilot is defective.
- ▷ If the thermo-electric voltage on the pilot ≥ 20 mV: The control valve is defective.
- Remove the defective unit and return it to the manufacturer for inspection.

Accessories

Gas restrictor orifice, air restrictor orifice

For adjusting the gas or air volume to increased supply pressures, a gas or air restrictor orifice is to be installed upstream of the burner.

Gas restrictor orifice

For ZTA

With internal thread: M12 \times 1 (for 8 \times 1 tube).

Hole [mm]	For gas pressures for operation with			Order No.
	natural gas [mbar]	propane [mbar]	town gas [mbar]	
1.1	–	–	40–60	74451461
0.8	–	–	60–100	74451462
0.65	4–120	–	100–300	74451466
0.47	120–300	40–120	300–900	74451469
0.36	300–700	120–300	900–1500	74451471
0.31	700–1500	–	–	74451472
0.27	–	300–700	–	74451474
0.24	–	700–1500	–	74451475

For ZT 40

With internal thread: M12 \times 1 (for 8 \times 1 tube).

Hole [mm]	For gas pressures for operation with			Order No.
	natural gas [mbar]	propane [mbar]	town gas [mbar]	
1.1	–	–	28–70	74451461
0.8	–	–	70–160	74451462
0.65	40–120	60–80	160–420	74451466
0.47	120–350	80–160	420–1500	74451469
0.36	350–1000	160–300	–	74451471
0.31	1000–1500	300–500	–	74451472
0.27	–	500–800	–	74451474
0.24	–	800–1200	–	74451475
0.21	–	1200–1500	–	74451476

Air restrictor orifice

The air restrictor orifice can be additionally fitted on the gas pilot ZT 40../100 upstream of an adjusting cock GEH 8 for adjusting to air supply pressures > 800 mbar.

With Rp 1/4" connecting thread, 1.5 mm hole.

The pressure loss of the orifice is 700 mbar at 1.5 m³/h of air.

Order No. 74452742.

High-voltage cable

For ignition cable.

FZLSi 1/7, -50 to 180°C (-58 to 356°F),

Order No. 04250410, or

FZLK 1/7, -5 to 80°C (23 to 176°F),

Order No. 04250409.

Thermo-cable and grounding cable

For transferring the thermo-electric voltage from the thermocouple of burners ZT 40 and ZTI 55 to the thermo-cable connection of the control valve S11T and for grounding.

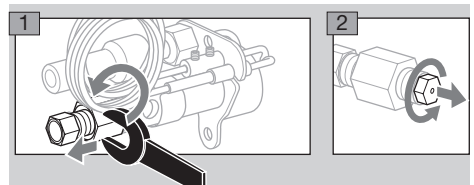
Cable cross-section 6 mm²,

Order No. 04250404

Gas nozzle

For ZTA for operation with town gas, diameter = 1.1 mm.

Order No. 75457938



3 Screw in the new gas nozzle.

4 Screw the gas connection flange back into the ZTA.

Technical data

Control valve S11T

Gas types: natural gas, coke oven gas or LPG.

Pilot gas connection: for 8 × 1 tube.

Opening time: 10–15 s.

Closing time (decrease of thermo-electric voltage + valve closing time): < 30 s.

Ambient temperature: -20 to +60°C.

Thermo-electric voltage:

extinction voltage: 8 mV.

Max. inlet pressure p_i :

S11T..01 = 100 mbar,

S11T..15 = 1.5 bar.

Gas pilot ZT

Gas types: natural gas, coke oven gas or LPG.

Capacity:

ZTA, ZT 40: 1 kW,

ZTI 55 for operation with

natural gas: 3.3 kW,

LPG: 2.5 kW,

town gas: 2.3 kW.

Thermo-electric voltage:

under load: 10–20 mV,

in idle state: 20–30 mV,

extinction voltage: < 8 mV.

Logistics

Transport

Protect the unit from external forces (blows, shocks, vibration). On receipt of the product, check that the delivery is complete, see page 2 (Part designations). Report any transport damage immediately.

Storage

Store the product in a dry and clean place.

Storage temperature: see page 10 (Technical data).

Storage time: 6 months in the original packaging before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.

Packaging

The packaging material is to be disposed of in accordance with local regulations.

Disposal

Components are to be disposed of separately in accordance with local regulations.

Contact

If you have any technical questions, please contact your local branch office/agent. The addresses are available on the Internet or from Elster GmbH.

We reserve the right to make technical modifications in the interests of progress.

Certification

Declaration of conformity



We, the manufacturer, hereby declare that the product S11T, marked with product ID No. CE-0063AQ001/04, complies with the requirements of the listed Directives and Standards.

Directives:

- 2009/142/EC – GAD (valid until 20 April 2018)
- 2014/35/EU

Regulation:

- (EU) 2016/426 – GAR (valid from 21 April 2018)

The relevant product corresponds to the tested type sample.

The production is subject to the surveillance procedure pursuant to Directive 2009/142/EC Annex II paragraph 3 (valid until 20 April 2018) and to Regulation (EU) 2016/426 Annex III paragraph 3 (valid from 21 April 2018).

Elster GmbH

Scan of the Declaration of conformity (D, GB) – see www.docuthek.com

Eurasian Customs Union



The product S11T/ZTA/ZT/ZTI meets the technical specifications of the Eurasian Customs Union.

Honeywell

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