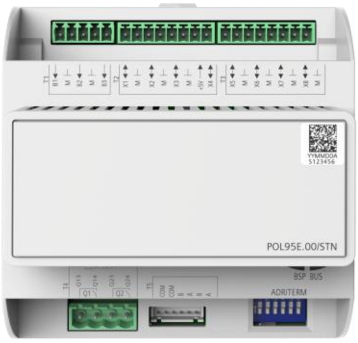
Climatix™

Climatix I/O extension module with 13 I/Os

POL95E.00/STN, POL95E.10/STN



This product offers the following features:

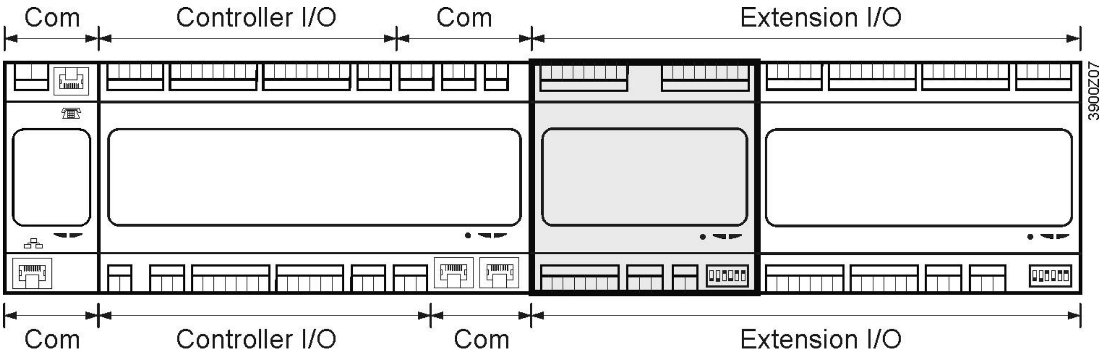
- Power supply AC 24 V or DC 24 V via the controller
- 3 analog inputs for NTC 10k temperature sensors
- 8 universal I/Os for analog or digital signals (configurable inputs/outputs)
- 2 relay outputs (NO contacts, two of them with high inrush capacity)
- 1 EEV interface
- Peripheral bus interface for local/remote extension I/Os
- For use with flammable refrigerants

Use

POL95E.x0/STN is a versatile Climatix I/O extension module that can be connected to any Climatix controller. Its high flexibility of universal inputs meets the requirements of the split heat pump unit industry as well as those of other heat pump and diverse applications. It is part of the Climatix product range (refer to data sheet Q3900en and mounting instructions M3910).

Climatix product range

Installation concept



Ordering

Type	Stock number (SSN)	Description	MOQ
POL95E.00/STN	S55663-J580-A120	Climatix I/O extension module 13 I/Os + 1 EEV; housing	12
POL95E.10/STN	S55663-J581-A120	Climatix I/O extension module 13 I/Os + 1 EEV; PCB	36

Accessories

Connector set (spring cage, cable top entry)	
1 x Phoenix FKCT 2,5/4-ST GY7035	-
2 x Phoenix FK-MCP 1,5/8-ST-3,81	-
1 x Phoenix FK-MCP 1,5/5-ST-3,81	-
1 x JST XHP-6	-
1 x Phoenix ZEC 1,0/4-LPV-3,5 GY35AUC2CI1V	POL001.45/STD/S55843-Z114-F100

Connector set (screw, cable side entry)	
2 x Phoenix MVSTBW 2,5/2-ST GY7035	POL005.25/STD/S55843-Z152-F100
2 x Phoenix MCVR 1,5/8-ST-3,81	POL004.85/STD/S55843-Z148-F100

Connector set (screw, cable side entry)	
1 x Phoenix MCVR 1,5/5-ST-3,81	POL004.55/STD/S55843-Z145-F100
1 x JST XHP-6	-
1 x Phoenix ZEC 1,0/4-LPV-3,5 GY35AUC2CI1V	POL001.45/STD/S55843-Z114-F100

Board-to-wire connector	
2 x Phoenix ZEC 1,0/4-ST-3,5 GY35AUC1R1,4	POL002.43/STD/S55843-Z124-D100

Product documentation

Title	Document ID
Mounting instruction for POL95E.xx/STN	A6V11977564
EU conformity (CE) for POL95E.xx/STN	A5W00117547A
RCM conformity (EMC) for POL95E.xx/STN	A5W00117548A
UKCA conformity for POL95E.xx/STN	A5W00291632A

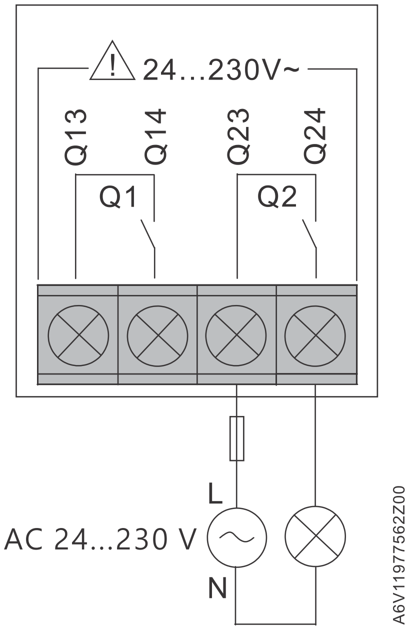
Technical data

Power supply	
Operating voltage	AC 24 V ±20 %; DC 24 V ±10 %
Frequency	45…65 Hz
Max. AC consumption	1.5 A at AC 24 V
Max. DC consumption	800 mA at DC 24 V
Connection	Peripheral bus

Power distribution	
Max. passthrough current	3.4 A at AC 24 V 3.66 A at DC 24 V

Relay output Q1, Q2 (T4)	
Relay: Type, contact	Monostable, NO contact
Contact rating	-
Switching voltage	AC 24…230 V (-20 %, +10 %)
	DC 12…24 V
Nominal current (res. / ind.)	AC 4 A / 3 A (cosφ 0.6)
Inrush current	Max. 15 A / max. 1 sec
External overcurrent protection	Fuse slow max. 6.3 A or Circuit breaker, type B, C or D

Relay output Q1, Q2 (T4)	
Operation	100,000 at AC 230 V, 4 A (res.)
Minimum switching load	30 mA at AC 19 V



Connecting circulating pumps to relay output

Universal I/Os X1…X8	
Configurable Reference potential	By software Terminals ⊥
Contact voltage	Max. DC 24 V (SELV)
Overvoltage protection	Max.40 V

Analog inputs (X1…X8)		
Ni1000		
Range	100 Ω...3800 Ω	
Accuracy	± 2706 mΩ at 1100 Ω	
Resolution	< 390 mΩ at 1100 Ω	
For Ni1000 (LG), see below		
Temperature range	Accuracy	Resolution
-50 °C	0.6 K	0.1 K
-25 °C	0.6 K	0.1 K

0 °C	0.6 K	0.1 K
25 °C	0.6 K	0.1 K
50 °C	0.65 K	0.1 K
100 °C	0.65 K	0.1 K
150 °C	0.7 K	0.1 K

Pt1000		
Range	100 Ω...3800 Ω	
Accuracy	± 2706 mΩ at 1100 Ω	
Resolution	< 390 mΩ at 1100 Ω	
For PT1000 (385), see below		
Temperature range	Accuracy	Resolution
-50 °C	0.6 K	0.1 K
-25 °C	0.6 K	0.1 K
0 °C	0.7 K	0.1 K
25 °C	0.7 K	0.1 K
50 °C	0.8 K	0.1 K
100 °C	0.9 K	0.15 K
150 °C	1.0 K	0.15 K

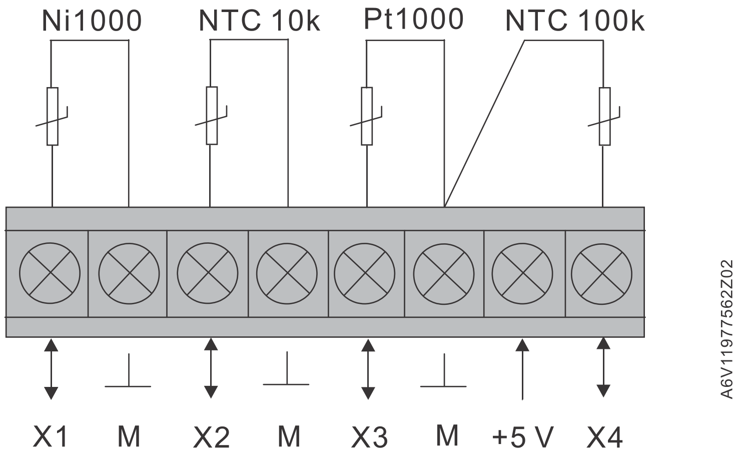
NTC 10k		
Range	100 Ω…760 kΩ	
Accuracy	± 132 Ω at 10 kΩ	
Resolution	< 43 Ω at 10 kΩ	
For NTC10k (B25/85 = 3977 K) , see below		
Temperature range	Accuracy	Resolution
-50 °C	0.6 K	0.1 K
-25 °C	0.2 K	0.1 K
0 °C	0.2 K	0.1 K
25 °C	0.2 K	0.1 K

50 °C	0.3 K	0.1 K
100 °C	0.7 K	0.1 K
150 °C	2.2 K	0.2 K

NTC 100k		
Range	100 Ω…1280 kΩ	
Accuracy	± 1320 Ω at 100 kΩ	
Resolution	< 437 Ω at 100 kΩ	
For NTC100k (B25/85 = 3977 K) , see below		
Temperature range	Accuracy	Resolution
-25 °C	1.4 K	0.2 K
0 °C	0.5 K	0.1 K
25 °C	0.3 K	0.1 K
50 °C	0.2 K	0.1 K
100 °C	0.3 K	0.1 K
150 °C	0.5 K	0.2 K

NTC 100k		
Range	100 Ω…1280 kΩ	
Accuracy	± 1320 Ω at 100 kΩ	
Resolution	< 437 Ω at 100 kΩ	
For NTC100k (B25/85 = 3977 K) , see below		
Temperature range	Accuracy	Resolution
-25 °C	1.4 K	0.2 K
0 °C	0.5 K	0.1 K
25 °C	0.3 K	0.1 K
50 °C	0.2 K	0.1 K
100 °C	0.3 K	0.1 K
150 °C	0.5 K	0.2 K

Resistance input 0...2500 Ω		
Range	0…3800 Ω	
Accuracy	± 2706 mΩ at 1100 Ω	
Resolution	< 390 mΩ at 1100 Ω	
Resistance range	Accuracy	Resolution
0 Ω	0.6 Ω	0.5 Ω
1250 Ω	3 Ω	0.5 Ω
2500 Ω	6 Ω	0.6 Ω

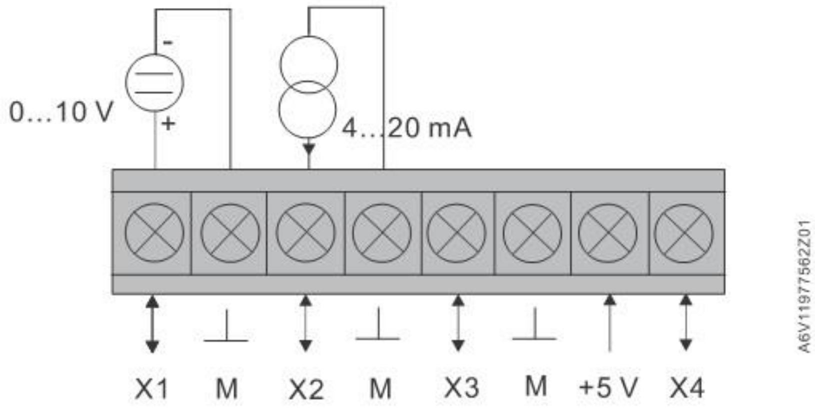


Connecting ratiometric sensor to universal I/Os
Connecting NTC to universal I/Os

Analog inputs (X1…X8)	
DC 0...10 V input	
Resolution	3 mV
Accuracy at 10 V	90 mV

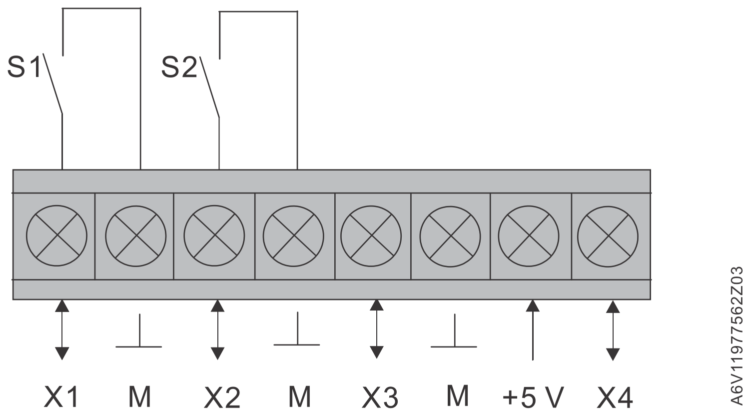
DC 0...5 V input	
Resolution	2 mV
Accuracy at 5 V	45 mV
Input resistance	>100 kΩ

0/4…20 mA input	
Resolution	5 µA
Accuracy at 20 mA	130 µA
Impedance of 0/4…20 mA input	< 500 Ω



Voltage input DC 0…10 V
Current input 4…20 mA

Digital inputs (X1…X8)	
0/1 digital signal (binary)	For potential-free contacts
Sampling voltage / current	DC 24 V / 6 mA
Contact resistance	Max. 200 Ω (closed) Min. 50 kΩ (open)



Connecting floating contacts to universal I/O
Use only the same voltage within the same connector

Analog outputs (X1…X8)	
DC 0...10 V output	
Resolution	12 mV
Accuracy at 10 V	124 mV
Output current	1 mA (short-circuit-proof)

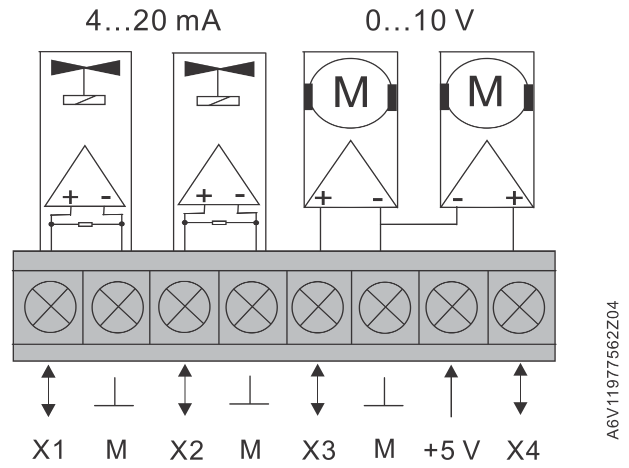
Analog outputs (X1, X2)	
DC 4…20 mA output	
Resolution	23 µA
Accuracy at 20 mA	243 µA

Universal I/Os	
DC outputs, e.g. for relay control X5…X8	
Switching voltage	Typical DC 24 V
Switching current	Max. 25 mA

Universal I/Os	
PWM outputs X5, X6	
Output voltage (high)	DC 8…12 V
Output voltage (low)	DC 0…1 V
Output current	Max. 10 mA
PWM frequency	500 Hz … 2.5 kHz (factory setting: 500 Hz)
Sampling ratio	0 % ~ 100 %
Resolution	0.5 %

Analog inputs	
Analog inputs (B1, B2, B3)	
NTC10 K	
Range	500 Ω – 670 kΩ
Accuracy	± 222 Ω at 10 kΩ
Resolution	< 44 Ω at 10 kΩ
For NTC10k (B25/85 = 3977 K) , refer to below	

Temperature range	Accuracy	Resolution
-50 °C	3.7 K	0.6 K
-25 °C	1 K	0.2 K
0 °C	0.5 K	0.1 K
25 °C	0.5 K	0.1 K
50 °C	0.7 K	0.2 K
100 °C	3.4 K	0.9 K
150 °C	5 K	2 K

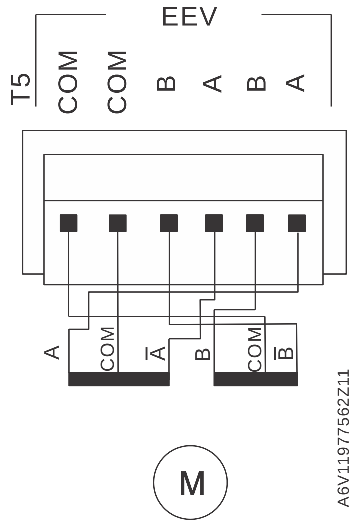


Connecting voltage and current output to universal I/O

Supply power for active / ratiometric sensors with 5 V (T2)	
Sensor power output for active sensor	
Reference voltage output for ratiometric measurements	
NOTICE! Not designed for sensors with pulse-like energy demand.	
Output voltage	DC 5 V (± 2.5 %)
Output current	Max. 60 mA (short-circuit proof)
Reference potential	System zero ⊥

EEV (T5)	
Configurable	By software
Connector	B6B-XH-A, JST

Stepper motor drive	
Motor	Unipolar stepper motor, half- or full-step mode configured via software
Connection	6 wires
Supply voltage	DC 12 V (short-circuit-proof)
Current limitation	Max. 375 mA
Driver output	4 channels
Length of motor cable	< 3 m



Connection terminals for T4	
Optional plugs for I/O signals	Phoenix FKCVW 2,5/x-ST Phoenix FKCT 2,5/x-ST Phoenix MVSTBW 2,5/x-ST
Solid wire	0.2…2.5 mm²
Stranded wire (twisted and with ferrule)	0.25…2.5 mm²
Cable lengths	Complying with load, local regulations and installation documents

Connection terminals for T1, T2, T3	
Optional plugs for I/O signals	Phoenix FMC 1,5/x-ST Phoenix FK-MCP 1,5/x-ST Phoenix MCVR 1,5/x-ST
Solid wire	0.14…1.5 mm²
Stranded wire (twisted and with ferrule)	0.25…1.5 mm²
Cable lengths	Complying with load, local regulations and installation documents

Peripheral bus	
Power supply	U_{eff} = AC 24 V ± 20 %, f_{main} = 45...65 Hz or U = DC 24 V ± 10 %, no internal fuse
Bus termination selectable	(120 Ω +1 nF)
Solid wire	0.2…1.0 mm²
Stranded wire (twisted and with ferrule)	0.2…1.0 mm²
Cable lengths	Max. 30 m
Addressing	DIP switch 1…5
Termination	DIP switch 6

Ambient conditions and protection classification	
Operation	IEC 60721-3-3
Temperature	-40...70 °C
Humidity	<95 % r.h. (non-condensing)
Atmospheric pressure	Min. 700 hPa, corresponds to max. 3,000 m above sea level
Transport	IEC 60721-3-2
Temperature	-40...70 °C
Humidity	<95 % r.h. (non-condensing)
Atmospheric pressure	Min. 260 hPa, corresponds to max. 10,000 m above sea level
Protection (POL95E.00/STN)	
Degree of protection	IP20 (EN 60529)
Safety class	As per the final product evaluation, suitable for use in plants featuring safety class II

Ambient conditions and protection classification	
Protection (POL95E.10/STN)	
Degree of protection	IP00 (EN 60529)
Safety class	As per the final product evaluation, suitable for use in plants featuring safety class II

Standards, directives and approvals	
Product standard	EN 60730-1 Automatic electronic controls for household and similar use.
Electromagnetic compatibility (applications)	Suitable for residential and industrial EMC environment
EU conformity (CE)	A5W00117547A/001
RCM conformity	A5W00117548A/001
UKCA conformity	A5W00291632A
Environmental compatibility	A5W00074466C
Flammable refrigerants	A5W02650921A Conformity to IEC 60335-2-40:2022: limited to clause 22.116 and 22.117. Conformity to IEC 60335-2-89:2019: limited to Clause 22.112, Clause 22.113, and Clause 22.114. POL95E with max. surface temperature < 135 °C Risk assessment is mandatory for all flammable refrigerants according to the local applicable standards and regulations via system operator. Compliant products are marked with A* on the labels.

General data POL95E.00/STN	
Dimensions of module	108 × 110 × 75 mm
Weight excl. packaging	215 g
Base	Plastic, pigeon-blue RAL 5014
Housing	Plastic, light-grey RAL 7035

General data POL95E.10/STN	
Dimensions of PCB module	103 × 105 × 41.5 mm
Weight excl. packaging	107 g

LED states

BSP LED states:

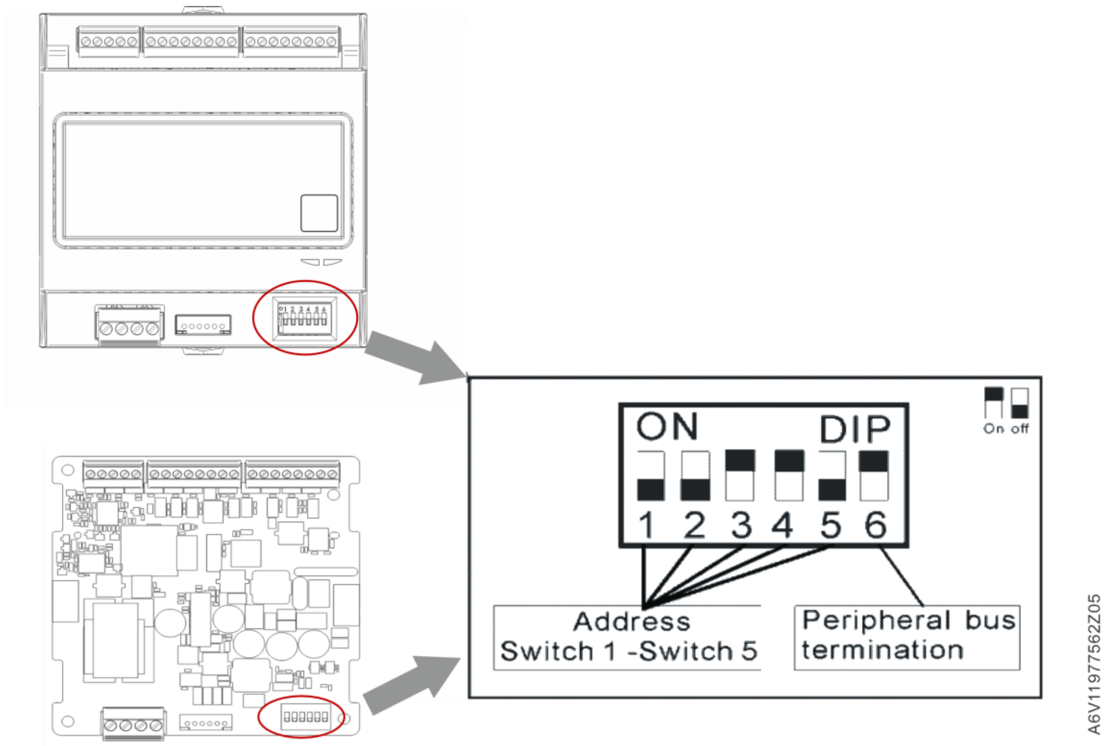
State	Meaning
Green ON	BSP running
Red flashing at 2 Hz	BSP error (software error)
Flashing between red and green, per second	BSP upgrade mode
Red ON	Hardware error

BUS LED indicates the controller's communications state. BUS LED states:

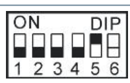
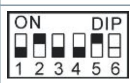
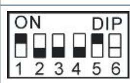
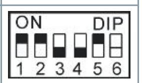
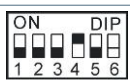
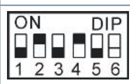
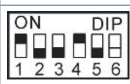
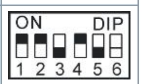
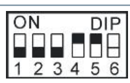
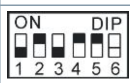
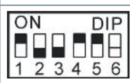
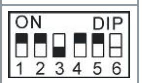
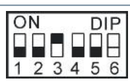
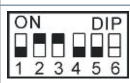
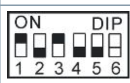
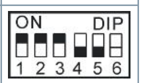
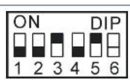
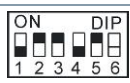
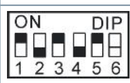
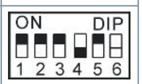
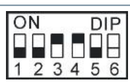
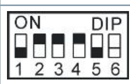
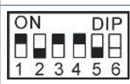
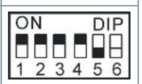
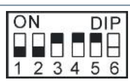
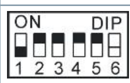
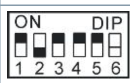
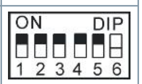
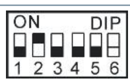
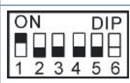
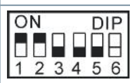
State	Meaning
Green ON	Communication running, I/O working
Orange ON	Communications active, but parameter not configured successfully
Red ON	Communication error

DIP switch

The extension module is equipped with a DIP switch to communicate with the controller. Switches 1, 2, 3, 4, and 5 can be configured for slave addresses, while switch 6 serves as peripheral bus termination. If the extension module is the network termination, switch 6 must be set to ON.



Bit order is 5 to 1. The lowest bit is 5, the highest is 1. Max. 31 slave addresses can be configured:

DIP switch configuration of extension module							
No.	Diagram	No.	Diagram	No.	Diagram	No.	Diagram
1		9		17		25	
2		10		18		26	
3		11		19		27	
4		12		20		28	
5		13		21		29	
6		14		22		30	
7		15		23		31	
8		16		24			

NOTICE	
!	The extension module address must be the same in the controller's application program. 0 cannot be set as slave address.

Notes

Engineering

NOTICE	
!	To protect against accidental contact with relays carrying voltages above 42 V_{eff}, the extension module must be installed in an enclosure (preferably a control panel). It must be impossible to open the enclosure without the aid of a key or tool.

AC 230 V cables must be double-insulated against safety extra low-voltage (SELV) cables.

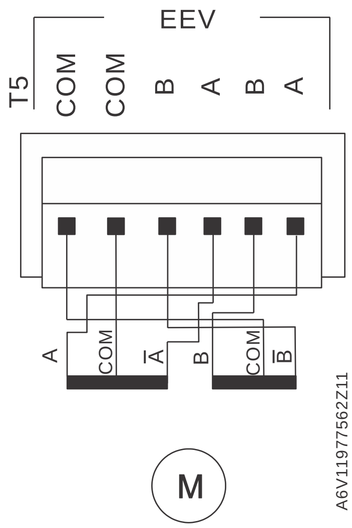
NOTICE	
!	The software for both POL95E and Climatix controller is available as of VVS11.52.

Disposal

The device is considered an electronic device for disposal in accordance with European guidelines and may not be disposed of as domestic waste.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Connection terminals

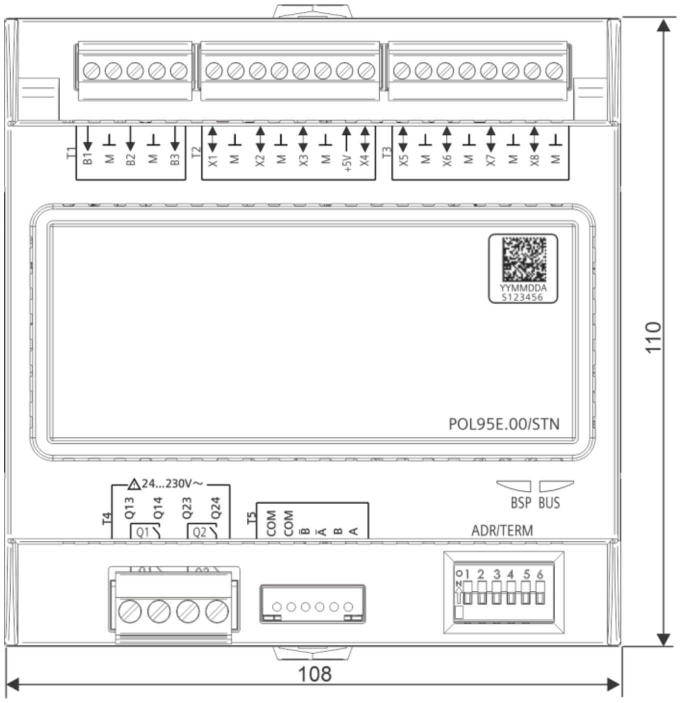


Slot	Terminal	Description
T1	B1, B2, B3	Analog inputs
	M	System zero
T2	X1, X2, X3, X4	Universal inputs/outputs

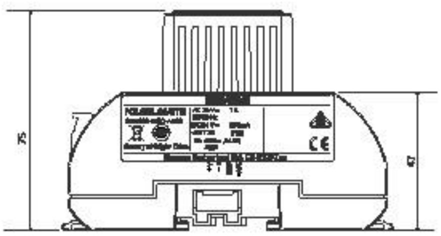
Slot	Terminal	Description
	M	System zero
	+5 V	5 V reference power
T3	X5, X6, X7, X8	Universal inputs/outputs
	M	System zero
T4	Q13, Q14	NO (normally open) contact Q1
	Q23, Q24	NO (normally open) contact Q2
T5	COM, COM, A, B, A-, B-	EEV, unipolar, full/half stepper

Dimensions (in mm)

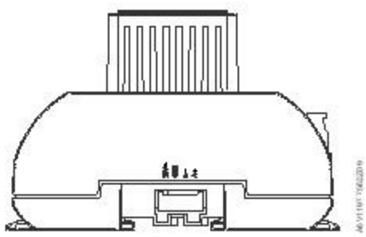
Climatix I/O extension module 13 I/Os + 1 EEV; housing



Top side

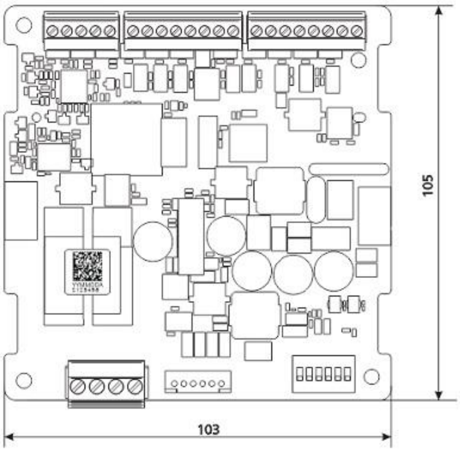


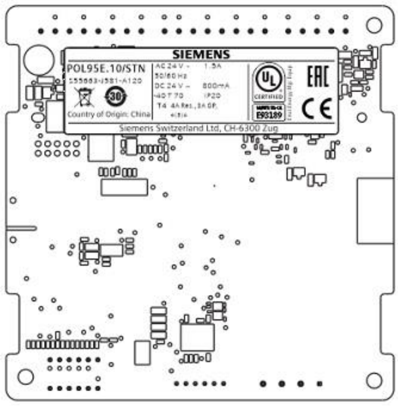
Right side



Left side

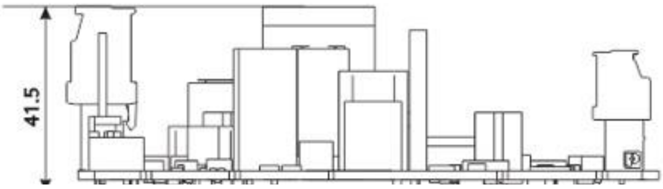
Climatix I/O extension module 13 I/Os + 1 EEV; PCB





Top side

Bottom side



Left side

Issued by
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Document ID A6V11977562_en--_e

Edition 2025-08-28