

VIPA FM355 / R355

4/8-Channel Controller Module

for Siemens S7-300 and VIPA System 300V

 3-349-327-03
 4/3.06

- Compatible with Siemens S7-300 and VIPA System 300V
- Software tool for complete configuration and parameter settings, import and export to and from S7 projects in the SIMATIC manager
- Online visualization of cyclically occurring data and configuration of process quantities via MPI (VIPA MP2I) interface, Ethernet TCP/IP, PROFIBUS-DP or PROFINET
- Sampling cycle 10 ms per channel
- 4/8 freely configurable control channels
- Binary inputs/outputs with short-circuit detection, freely assignable to controller states, functions and channels (depending upon variant)
- Non-assigned I/Os are freely available to the CPU
- PDPI control without overshooting
- Control parameters adaptation can be started at any time for each channel
- Control functions: limit transducer / 2-step, 3-step, continuous action and step-action controller
- Fixed value, cascade, differential and switch control
- Hot runner control with actuating circuit and booster circuit
- Assignment to groups for control zones for synchronous heating
- Water cooling control (non-linear cooling effect with evaporation)
- Data logger for all actual values and setpoints
- Alarm history with time stamp



Features

- 4/8 sensor inputs, thermocouples, Pt100 or direct current and direct voltage can be selected individually with the software
- Thermocouple inputs immune to leakage current (up to 230 V)
- Removable cold junction, available as accessory equipment
- Suitable for zones with temperature rises of approximately 100 K/s to less than 100 K/h
- Mapping for checking sensor-actuator assignments
- Monitoring for sensor failure, reversed polarity and short-circuiting
- Regulated temperature becomes active in the event of sensor failure
- Actual value correction for periodic measured-value fluctuation
- All zones can be deactivated as desired with internal or external signal or manual operation possible
- Setpoint ramps (up-down), proxy setpoint, setpoint limiting
- Feed-forward control for the avoidance of overshooting and undershooting during load reversal
- Heating circuit monitoring without additional transformer
- Heating current monitoring with single/3-phase external current transformers and an optional voltage transformer for compensation of voltage fluctuation
- Numerous monitoring functions including, amongst others, channel and device-specific alarms, read-back outputs
- 2nd set of parameters
- Short-circuit detection at the binary outputs
- 24 V DC auxiliary power supply
- RS-232 service interface

Applications

Production processes are no longer perceived as individual sub-processes, but rather as integral constituents of an overall process. Thanks to integration of VIPA FM355 / R355 4 and 8-channel controller modules into the SIMATIC platform, users now have access to concentrated control technology know-how for the Siemens S7-300 compact modular automation system and the VIPA System 300V. Continuous communication amongst all automation components is assured by the backplane bus. The high performance 355Config configuration tool allows for full configuration and parameter settings (import and export to and from S7 projects in the SIMATIC manager). Productivity is thus increased for project implementation, and engineering and life-cycle costs are reduced as a result. Beyond this, expenses for initial start-up, maintenance and service are also reduced.

Applications include multi-channel temperature controllers for rubber and plastics processing machines (injection molding, extrusion, blow molding, hot-runner technology), semiconductor manufacturing processes, industrial and laboratory ovens, textile and packaging machines, climatic test cabinets, refrigerator and heater manufacturing, pharmaceuticals, chemicals, process engineering, food processing industry, wood and paper industries, glass and ceramics industry, temperature control devices and similar thermal processes. Furthermore, the module is used for facility automation applications.

The specially developed control algorithm for compensation of non-linear water evaporation characteristics allows for water-cooled extruder zone applications.

VIPA FM355 / R355

4/8-Channel Controller Module

Description

The autonomous VIPA FM355 / R355 temperature controllers can be very quickly configured, and can be adapted to control systems by means of self-tuning. Outstanding control performance is achieved by means of GOSSEN METRAWATT's own dead-beat PDPI algorithm. Thanks to a well thought-out range of variants, for example with or without actuator output, trouble-free use is also possible over considerable distances. In addition to the standardized functions, the following have been integrated as well: a data logger for all actual values and setpoints, an alarm history for error status entries with time stamp, and mapping (a test tool which checks for correct heater and sensor wiring). A booster circuit, synchronous heating via all controller modules, and heating current monitoring with only a single summation current transformer via up to 24 control channels have been included as well for use with hot-runner tools.

Applicable Regulations and Standards

IEC 61010-1 / EN 61010-1 / VDE 0411, part 1	Safety requirements for electrical equipment for measurement, control and laboratory use
IEC 60529 / EN 60529 DIN VDE 0470 part 1	Protection provided by enclosures for electrical equipment (IP code)
DIN EN 60204-1 / VDE 0113, Part 1	Machine safety
DIN EN 61326 VDE 0843, part 20	Electrical equipment for measurement, control and laboratory use – EMC requirements
IEC 60584 / EN 60584 (DIN 43710)	Thermocouples
IEC 60751 / DIN EN 60751	Industrial platinum resistance thermometers and platinum resistance elements, Pt100 sensors

Connector Pin Assignments

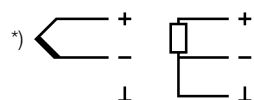
4-Channel Controller

Depending upon variant:

- Measurement inputs: thermocouple/Pt100 or direct voltage/current
- With or without actuator outputs (binary I/Os)

Front Plug Pin Assignments, 4 Thermocouples / Pt100 Sensors

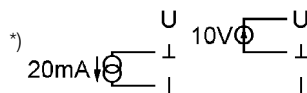
For connection of	1	L+	21	For connection of
24 V DC supply power				24 V DC supply power
1 A heating current transformer Phase 1	2 1k	2k	22	1 A heating current transformer Phase 2
1 A heating current transformer Phase 3	3 1l	2l	23	Heating voltage transformer (transformer, approx. 30 V)
Temperature sensor Channel 1 *)	4 3k	u	24	Temperature sensor Channel 2
	5 3l	v	25	*)
	6 +	+	26	Temperature Sensor Channel 4
	7 - 1	2 -	27	*)
Z355 reference junction	8 ⊥	⊥	28	
	9 C1	+	29	
	10 C2	4 -	30	
Temperature Sensor Channel 3 *)	11 +	⊥	31	
	12 - 3	IO1	32	Digital input / output 1 **)
Analog output 1 (+10V/+20mA)	13 ⊥	IO2	33	Digital input / output 2 **)
Analog output 2 (+10V/+20mA)	14 AO1	IO3	34	Digital input / output 3 **)
Analog output ground (M)	15 AO2	IO4	35	Digital input / output 4 **)
	16 AGND	IO5	36	Digital input / output 5 **)
RS 232 (pin 3)	17 Rx	IO6	37	Digital input / output 6 **)
service (pin 2)	18 Tx	IO7	38	Digital input / output 7 **)
interface (pin 5)	19 GND	IO8	39	Digital input / output 8 **)
	20	M	40	Power supply ground



*) only for variant with binary I/Os

Front Plug Pin Assignments 4 ea. 10 V / 20 mA

For connection of	1	L+	21	For connection of
24 V DC supply power				24 V DC supply power
1 A heating current transformer Phase 1	2 1k	2k	22	1 A heating current transformer Phase 2
1 A heating current transformer Phase 3	3 1l	2l	23	Heating voltage transformer (transformer, approx. 30 V)
+ 0 ... 10 V Controlled variable, channel 1 *)	4 3k	u	24	+ 0 ... 10 V Controlled variable, channel 2 *)
+ 0/4 ... 20 mA	5 3l	v	25	+ 0/4 ... 20 mA
	6 U	U	26	+ 0 ... 10 V Controlled variable, channel 4*)
	7 ⊥ 1	2 ⊥	27	+ 0/4 ... 20 mA
	8 I	I	28	
	9	U	29	
	10	4 ⊥	30	
+ 0 ... 10 V Controlled variable, channel 3 *)	11 U	I	31	+ 0/4 ... 20 mA
+ 0/4 ... 20 mA	12 ⊥ 3	IO1	32	Digital input / output 1 **)
Analog output 1 (+10 V/+20 mA)	13 I	IO2	33	Digital input / output 2 **)
Analog output 2 (+10 V/+20 mA)	14 AO1	IO3	34	Digital input / output 3 **)
Analog output ground (M)	15 AO2	IO4	35	Digital input / output 4 **)
	16 AGND	IO5	36	Digital input / output 5 **)
RS232 (pin 3)	17 Rx	IO6	37	Digital input / output 6 **)
service (pin 2)	18 Tx	IO7	38	Digital input / output 7 **)
interface (pin 5)	19 GND	IO8	39	Digital input / output 8 **)
	20	M	40	Power supply ground



*) only in variant with binary I/Os

VIPA FM355 / R355

4/8-Channel Controller Module

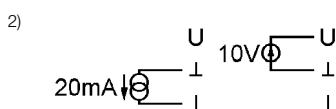
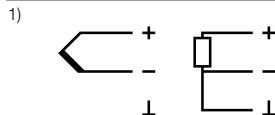
8-Channel Controller

Depending upon variant:

- Measurement inputs: thermocouple/Pt100 or direct voltage/current
- With or without actuator outputs (binary I/Os)

Pin Assignments, Left Front Plug, AI, 8 ea. Thermocouple

For connection of	1	L+	21	For connection of
1 A heating current transformer Phase 1	2 1k	2k	22	24V DC supply power
1 A heating current transformer Phase 2	3 1l	2l	23	1A heating current transf. Phase 2
1 A heating current transformer Phase 3	4 3k	u	24	Heating voltage transformer (transformer, approx. 30 V)
	5 3l	v	25	
	6		26	
Temperature Sensor Channel 1 1)	7 +	+	27	Temperature sensor Channel 2 1)
	8 - 1	2 -	28	
	9 ⊥	⊥	29	
Z355 reference junction	10 C1	C2	30	
Temperature sensor Channel 3 1)	11 +	+	31	Temperature sensor Channel 4 1)
	12 - 3	4 -	32	
	13 ⊥	⊥	33	
Temperature sensor Channel 5 1)	14 +	+	34	Temperature sensor Channel 6 1)
	15 - 5	6 -	35	
	16 ⊥	⊥	36	
Temperature sensor Channel 7 1)	17 +	+	37	Temperature sensor Channel 8 1)
	18 - 7	8 -	38	
	19 ⊥	⊥	39	
	20	M	40	Power supply ground



³⁾ is also required for supplying analog outputs and service interface

⁴⁾ only in variant with binary I/Os

Pin Assignments, Left Front Plug, AI, 8 ea. U/I

For connection of	1	L+	21	For connection of
1 A heating current transformer Phase 1	2 1k	2k	22	24 V DC supply power
1 A heating current transformer Phase 2	3 1l	2l	23	1A heating current transf. Phase 2
1 A heating current transformer Phase 3	4 3k	u	24	Heating voltage transformer (transformer, approx. 30 V)
	5 3l	v	25	
	6		26	
+ 0 ... 10 V Controlled variable, channel 1 ²⁾	7 U	U	27	+ 0 ... 10 V Controlled variable, channel 2 ²⁾
+ 0/4 ... 20 mA	8 ⊥ 1	2 ⊥	28	+ 0/4 ... 20 mA
	9 I	I	29	
	10		30	
+ 0 ... 10 V Controlled variable, channel 3 ²⁾	11 U	U	31	+ 0 ... 10 V Controlled variable, channel 4 ²⁾
+ 0/4 ... 20 mA	12 ⊥ 3	4 ⊥	32	+ 0/4 ... 20 mA
	13 I	I	33	
+ 0 ... 10 V Controlled variable, channel 5 ²⁾	14 U	U	34	+ 0 ... 10 V Controlled variable, channel 6 ²⁾
+ 0/4 ... 20 mA	15 ⊥ 5	6 ⊥	35	+ 0/4 ... 20 mA
	16 I	I	36	
+ 0 ... 10 V Controlled variable, channel 7 ²⁾	17 U	U	37	+ 0 ... 10 V Controlled variable, channel 8 ²⁾
+ 0/4 ... 20 mA	18 ⊥ 7	8 ⊥	38	+ 0/4 ... 20 mA
	19 I	I	39	
	20	M	40	Power supply ground

Pin Assignments, Right Front Plug, DI0, 24 ea. 24 V DC

For connection of	1	1L+	2L+	21	For connection of
Supply power, 24V, IO17...24 ⁴⁾	2	1O17	IO1	22	Supply power, 24V, IO1 ... 8 ⁴⁾
Digital input / output 17 ⁴⁾	3	IO18	IO2	23	Digital input / output 1 ⁴⁾
Digital input / output 18 ⁴⁾	4	IO19	IO3	24	Digital input / output 2 ⁴⁾
Digital input / output 19 ⁴⁾	5	IO20	IO4	25	Digital input / output 3 ⁴⁾
Digital input / output 20 ⁴⁾	6	IO21	IO5	26	Digital input / output 4 ⁴⁾
Digital input / output 21 ⁴⁾	7	IO22	IO6	27	Digital input / output 5 ⁴⁾
Digital input / output 22 ⁴⁾	8	IO23	IO7	28	Digital input / output 6 ⁴⁾
Digital input / output 23 ⁴⁾	9	IO24	IO8	29	Digital input / output 7 ⁴⁾
Digital input / output 24 ⁴⁾	10	1M	2M	30	Digital input / output 8 ⁴⁾
Power supply ground ⁴⁾					Power supply ground ⁴⁾
Analog output 1 (+10 V/+20 mA)	11		3L+	31	Supply power, 24 V, IO9 ... 16 ³⁾
Analog output 2 (+10 V/+20 mA)	12	AO1	IO09	32	Digital input / output 9 ⁴⁾
Analog output 3 (+10 V/+20 mA)	13	AO2	IO10	33	Digital input / output 10 ⁴⁾
Analog output 4 (+10 V/+20 mA)	14	AO3	IO11	34	Digital input / output 11 ⁴⁾
Analog output ground (3M)	15	AO4	IO12	35	Digital input / output 12 ⁴⁾
RS232 (pin 3)	16	AGND	IO13	36	Digital input / output 13 ⁴⁾
service (pin 2)	17	Rx	IO14	37	Digital input / output 14 ⁴⁾
interface (pin 5)	18	Tx	IO15	38	Digital input / output 15 ⁴⁾
	19	GND	IO16	39	Digital input / output 16 ⁴⁾
	20		3M	40	Power supply ground

VIPA FM355 / R355

4/8-Channel Controller Module

Characteristic Values

Inputs / Outputs

Sampling rate 10 ms per channel

Measurement input: thermocouple / 50 mV linear

Thermocouples Per IEC 60584 / EN 60584 / DIN 43710 type J, L, K, R, S, B and N

Measuring range Linear, 0 to 50 mV

Nominal input range for type
J, L 0 ... 900° C
K 0 ... 1300° C
R, S 0 ... 1750° C
B 0 ... 1800° C
N 0 ... 1300° C

Accuracy / error < 0.7% of measuring range span for types J, L, K and N
< 2.0% of measuring range span for types R and S, as of 600° C for type B

Resolution 0.1 K

cont. overload AC: 50 / 60 Hz / 50 V AC, sinusoidal
DC: 1 V DC

Input impedance approx. 50 kΩ

Error message For sensor breakage or polarity reversal, or temperature outside of measuring range

Reference Junction Measurement Input

Nominal input range 0 to 70° C

Accuracy ± 2 K

Reference junction removable, available as accessory equipment

Pt100 Resistance Thermometer Measurement Input, 2 or 3-Wire Connection

Pt100 per IEC 60751 / DIN EN 60751

Measuring range 60 to 280 Ω

Nominal Input range -100 to 600° C

Sensor current < 0.2 mA

Offset compensation Possible by means of parameter entry

Accuracy / error < 0.7 % of measuring range

Resolution 0.1 K

Cont. overload AC: 50 / 60 Hz / 50 V AC, sinusoidal
DC: 1 V DC

Input impedance approx. 18 kΩ

Cable resistance (both directions) 2-wire connection: 0 to 30 Ω, adjustable
3-wire connection: 0 to 30 Ω, compensated

Error message For sensor breakage or short-circuit, or temperature outside of measuring range

Sensor Input Configuration

Sensor type is selected separately for each input.

Measurement Input: Direct Voltage, Direct Current

	Direct voltage	Direct current
Measuring range	0 / 2 to 10 V, configurable	0 / 4 to 20 mA, configurable
Continuous overload	100 V	60 mA DC
Input impedance / load	approx. 84 kΩ	approx. 45 Ω
Error message	when measuring quantity exceeds or falls below measuring range by more than 10 %	
Accuracy	< 0.7 % of measuring range span	
Resolution	< 0.1 % of final value	

Heating Current Monitoring Input

Measuring range 1 A AC (direct connection of a commercially available measuring transducer)

Resolution < 0.1% of upper range value

Accuracy typically < 5% of upper range limit

Reproducibility < 1% of measured value + 0.5% of upper range limit

Heating Voltage Monitoring Input

Measuring range 10 to 50 V AC (direct connection of a commercially available measuring transducer)

Resolution < 0.1% of upper range value

Accuracy typically < 5% of upper range limit

Reproducibility < 1% of measured value + 0.5% of upper range limit

Binary Inputs and Outputs (depending upon variant)

Output function Active switching outputs supplied directly from auxiliary voltage

Functions Switching output (heating/cooling or more/less for step-action controllers)
alarm output
non-assigned I/Os are freely available to CPU

Read-out cycle Adjustable within a range of 0.1 to 300 s

Nominal range of use H signal: $U \geq$ auxiliary voltage - 0.5 V
 $I \leq 100$ mA

L signal: < 0.1 mA

e.g. for controlling up to 3 commercially available semiconductor relays (SSR) in series

Input function Read back output status, external control of PLC etc.
non-assigned I/Os are freely available to CPU

Nominal range of use H signal: > 14 V / 8 ... 16 mA at 24 V
L signal: < 7 V / < 0.2 mA

Overload limit

H and L signals Continuous short-circuit, interruption

Continuous Outputs

Output function Actuator output for proportional actuator

Output quantity 0 (2) ... 10 V at > 1 kΩ load,
0 (4) ... 20 mA at < 300 Ω load

Resolution 0.1% of upper range value

Accuracy < 3% of upper range limit

Status indicators (depending upon variant)

Power on (L+)	green
Run	green
Controller active (loop)	green
Error	red
Binary I/Os active	green

VIPA FM355 / R355

4/8-Channel Controller Module

Control Performance

Setpoints

Setpoint limiting	Adjustable upper and lower setting limits
Setpoint 2	Activated via binary input or bus, adjustable value
Setpoint increase (boost)	Activated via binary input or bus, value and maximum duration can be configured
Ramp Function (separate for rise and fall)	Specification of gradual temperature change in degrees/min. Activated by means of: - Turn on auxiliary voltage - Change current setpoint value - Activate proxy setpoint - Switch from manual to automatic operation

Configurable Control Modes

Unused	No error monitoring														
Measure	With limit value monitoring														
Actuator															
Limit transducer	Two / three-step controller without time response														
PDPI controller	<table> <tr> <td>Heating</td><td>Cooling</td></tr> <tr> <td colspan="2">Can be combined as desired</td></tr> <tr> <td>Switching</td><td>Switching</td></tr> <tr> <td>Hot-runner</td><td>Water cooling</td></tr> <tr> <td>Continuous</td><td>Continuous</td></tr> <tr> <td>Step</td><td>Step</td></tr> <tr> <td>No heating</td><td>No cooling</td></tr> </table>	Heating	Cooling	Can be combined as desired		Switching	Switching	Hot-runner	Water cooling	Continuous	Continuous	Step	Step	No heating	No cooling
Heating	Cooling														
Can be combined as desired															
Switching	Switching														
Hot-runner	Water cooling														
Continuous	Continuous														
Step	Step														
No heating	No cooling														
Proportional actuator	Two / three-step controller without time response														

In addition to fixed value control, the PDPI controller also includes differential, cascade and switching controller functions.

Control Channel Combinations

Differential contr.	The temperature difference is corrected.
Cascade contr.	The setpoint from one or more control channels is manipulated dynamically.
Switch contr.	Depending upon operating state, a control loop with only one actuator can be controlled at two different (temperature) measuring points.

Self-Tuning

Can be started at any time from any operating state. Control parameters can be changed.

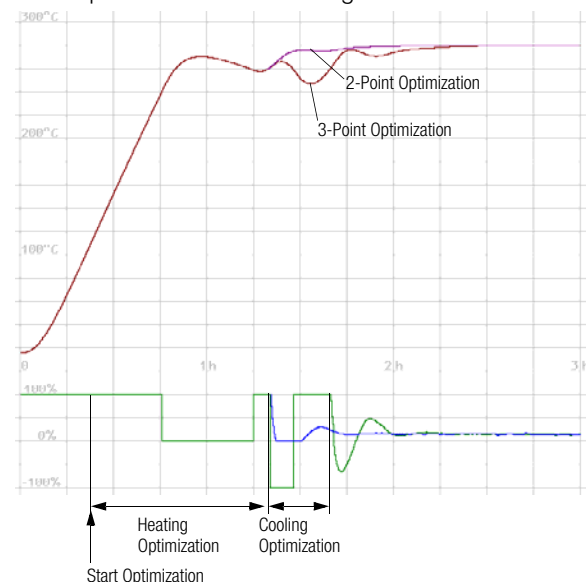


Figure 1: Control Performance with Self-Optimization

Alarms

All errors and alarms for all channels, I/Os and functions can be accessed separately.

Selected errors and alarms can be read out to the binary outputs. Selection and assignment to a specific output can be configured as desired.

Channel-Specific Alarms

- Broken sensor, reversed polarity
- Two upper and two lower limit values, relative and absolute
- Heating current / heating circuit errors
- Adaptation errors

Device-Specific Alarms

- Hardware errors
- Overloading of the measurement inputs
- Reference junction errors
- I/O errors
- Mapping errors
- Parameter errors

Alarm History

The alarm history stores 100 error status entries with respective time stamps in a ring memory. Recording is started over each time the device is reset, and data are lost if auxiliary power fails.

Monitoring Functions

Limit Value Monitoring

Two upper and two lower limit values can be configured per channel.

Alarm memory and actuation suppression can be set up.

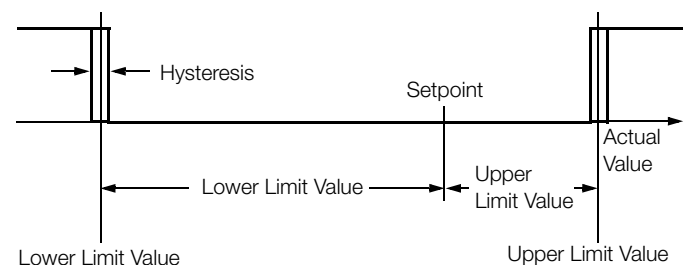


Figure 2: Schematic Representation of Relative Limit Value Monitoring

VIPA FM355 / R355

4/8-Channel Controller Module

Heating Current Monitoring

Heating current monitoring	Permanently installed
Heating current acquisition	With external, commercially available current transformer. Measurement of summation current for all 8 channels. Measurement of summation current for up to 24 channels is possible with a transformer

Nominal value transfer Initiated automatically via the bus

Compensation of current fluctuation By measuring heating voltage

Error Messages for	
– Antivalence	Actuator signal OFF + heating current ON Actuator signal ON + heating current OFF
– Actual current value less than nominal value	Dip below nominal heating current value by more than 5% + 0.1 A with actuator signal ON

Heating Circuit Monitoring

Without external transformer, without additional parameters

Configurable Heating circuit monitoring active / inactive

Error Messages for 100% heat without rising temperature, i.e. for short-circuited thermocouple, interrupted heating, no sensor in heating circuit

Hot Runner Control Functions

Actuating Circuit

Actuation with a reduced manipulating factor and dwelling at a specific actuation setpoint serves to dry out hygroscopic heating elements.

Group Actual Value Control – Synchronous Heating

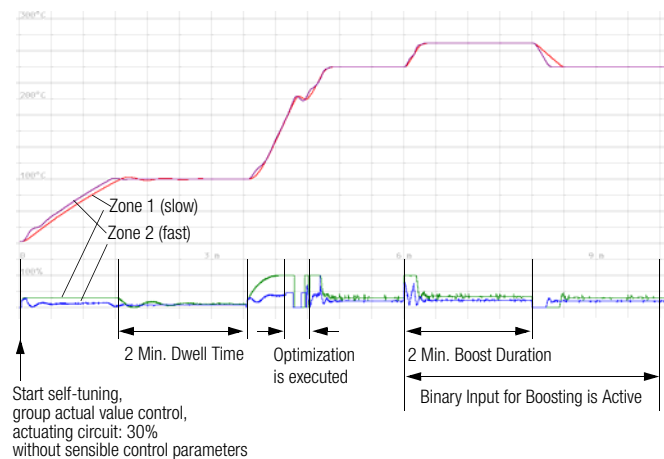
Synchronous heat-up prevents thermal stress by minimizing actual value differences.

If self-tuning has been started, it takes actual value management into consideration, as well as the actuating circuit.

Synchronous heat-up via several controller modules is also possible.

Boosting – Temporarily Increased Setpoint

Temporarily increasing the setpoint frees clogged mould nozzles of “frozen” material remnants.



Mapping for Checking Sensor and Heater Assignments

This function is used to test for correct wiring of the heater and the sensors. Assignments can be checked when the machine is started up before initial heat-up. Testing is conducted in several phases in order to determine whether or not the temperature changes at the individual channels coincide with the actuating signals. If an error is detected, all actuating outputs remain inactive until the error has been acknowledged.

Data Logger

The data logger stores 3600 sampled value pairs including actual values and manipulated variables for all 4/8 channels in a ring memory.

Recording duration can be set between 6 minutes and 25 days. Recording is started over each time the device is reset, and data are lost if auxiliary power fails.

Service Interface

A laptop or a notebook can be connected to the RS 232 interface for service purposes, and for configuration.

Type	Service Interface
Interface	RS 232
Maximum number of devices	1
Transmission Speed	19.2 kBaud
Protocol per	EN 60870

Supply power L+

A fully isolated safety power supply must be used to operate the device.

Nominal value	24 V DC
Nominal range of use	18 ... 30 V DC
Power consumption	maximum 10 Watt, typically 6 W (without load)

VIPA FM355 / R355

4/8-Channel Controller Module

Reference Conditions

Reference Quantity	Reference Condition
Auxiliary voltage	24 V DC $\pm$ 1 V
Superimposed alternating voltage	Sinusoidal, or sinusoidal half-waves: 0.1 V AC
Allowable common-mode voltage	To electrically connected inputs: 0 V DC / AC
Ambient temperature	23° C $\pm$ 2 K
Reference junction temperature	23° C $\pm$ 2 K
Warm-up time	3 minutes
Measurement inputs	Thermocouple, low-resistance termination: $\leq$ 10 Ω Pt100: 110 $\pm$ 10 Ω

Influencing Quantities and Influence Error

Influencing Quantity	Nominal Range of Use	Maximum Influence Error
Ambient temperature – Thermocouple / Pt100 – Reference junction	0° C ... + 50° C 0° C ... + 50° C	$\pm$ 0.05% MRS ¹⁾ / K 0.1 K / K
Cable resistance – Thermocouple – Pt100, 2-wire – Pt100, 3-wire	RL = 0 ... 200 Ω RL = 0 ... 30 Ω RL = 0 ... 30 Ω	$\pm$ 0.1% MRS ¹⁾ / 10 Ω Approx. 3 K / Ω (adjustable) $\pm$ 2 K / 10 Ω
Warm-up influence	$\leq$ 3 min	$\pm$ 1%

¹⁾ MRS = measuring range span

Electrical Safety

Variant	IEC 61010-1 / EN 61010-1 / VDE 0411, part 1
Safety class	II
Overvoltage category	CAT I
Fouling factor	2
Protection	IEC 60529 / EN 60529 / VDE 0470, part 1
Housing	IP 20
Terminals	IP 20

Attention: The device is not equipped with its own mains switch.

Electromagnetic Compatibility

Interference Emission		IEC 61326/EN 61326		
Interference Immunity		IEC 61326/EN 61326		
Test type	Standard	Test severity		Criterion
ESD	EN 61000-4-2	4 kV	Contact discharge	A
		8 kV	Atmospheric discharge	A
E field	EN 61000-4-3	10 V / m	80 ... 1000 MHz	A
Burst	EN 61000-4-4	2 kV	At all connector cables	A
Surge	EN 61000-4-5	1 kV	Asymmetrical	A
HF	EN 61000-4-6	3 V	0.15 ... 80 MHz, all terminals	A
NF	EN 61000-4-8	30 A/m	Magnetic field at system frequency	A
	EN 61000-4-11		Voltage dip	A

Ambient Conditions

Annual mean relative humidity, no condensation	5 to 95%
Ambient temperature	
– Nominal Range of Use	0° C ... + 60° C
– Operating range	0° C ... + 60° C
– Storage range	– 25° C ... + 70° C

Mechanical Design

Basic housing dimensions:

Single width (W x H x D) in mm: 40 x 125 x 120

Double width (W x H x D) in mm: 80 x 125 x 120

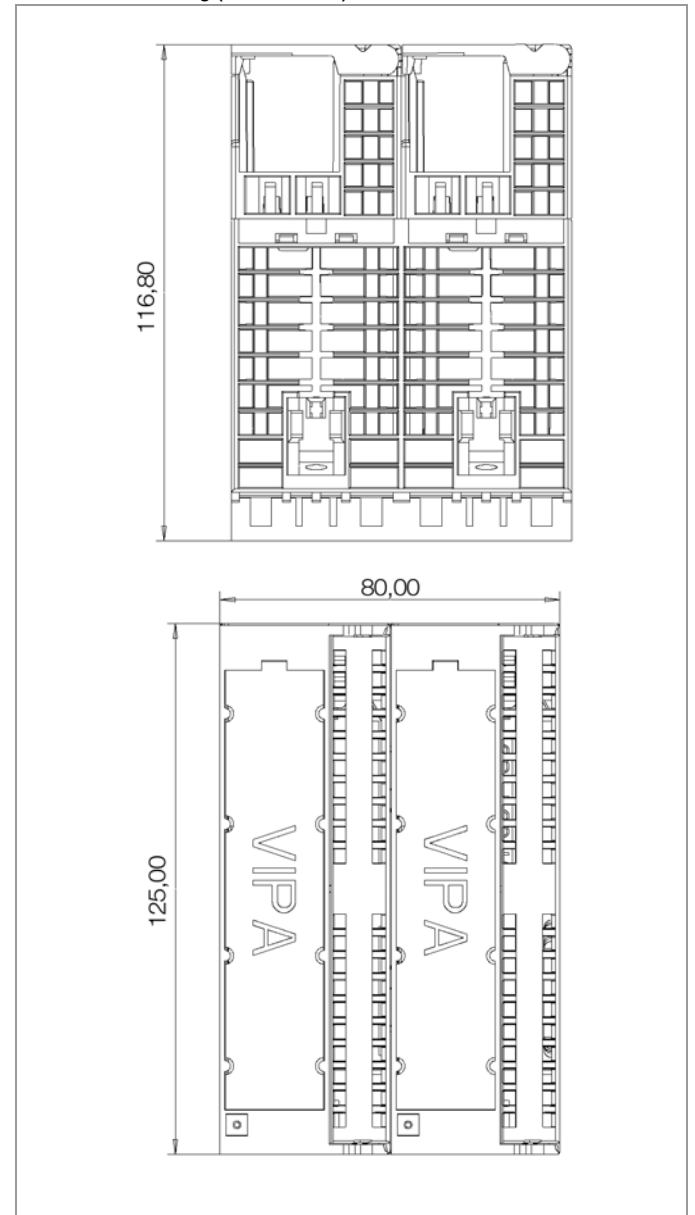
Weight 4-channel module: approx. 250 g

8-channel module: approx. 500 g

Type of connection 40-pin front plug

Mounting on S7-300 channel

Dimensional Drawing (double width)



VIPA FM355 / R355

4/8-Channel Controller Module

Order Information

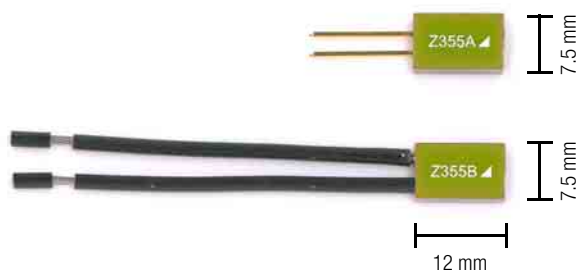
4-Channel Temperature Control Module		
Article Number	Measurement Inputs	Binary I/Os
VIPA FM355-3SD00 / R355A	Current / voltage	None
VIPA FM355-3SD10 / R355B	Thermocouple / Pt100	None
VIPA FM355-4SD00 / R355E	Current / voltage	8
VIPA FM355-4SD10 / R355F	Thermocouple / Pt100	8

8-Channel Temperature Control Module		
Article Number	Measurement Inputs	Binary I/Os
VIPA FM355-3SF00 / R355C	Current / voltage	None
VIPA FM355-3SF10 / R355D	Thermocouple / Pt100	None
VIPA FM355-4SF00 / R355G	Current / voltage	24
VIPA FM355-4SF10 / R355H	Thermocouple / Pt100	24

Accessories

Description	Article Number
Removable cold junction for front plug with screw connection	Z355A
Removable cold junction for front plug with spring terminals	

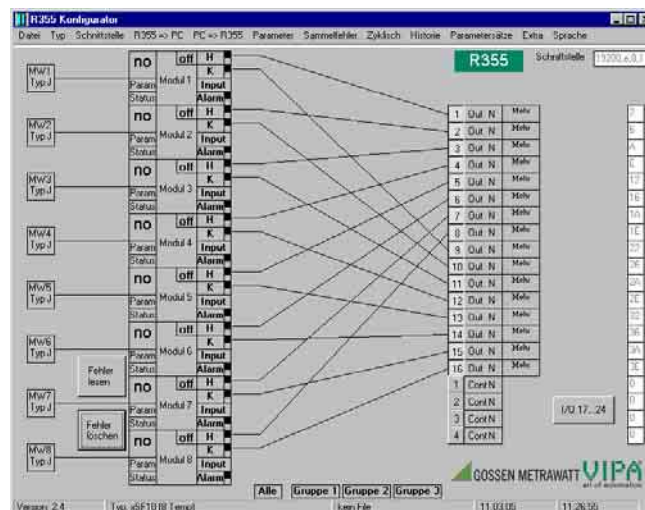
Removable Cold Junctions



Visualization and Configuration

355Config Configuration Tool and data modules for S7-300

The 355Config software tool allows for complete configuration and parameter setting via the import and export function (WLD file) into a S7 project of the SIMATIC Manager. Data modules (Library) for communication via backplane bus are provided free of charge for Siemens and VIPA CPUs (also for Speed7).



Visualization

Online visualization of cyclically occurring values including, amongst others, actual values, control variables, heating current, alarms ..., as well as configuration of process quantities including, amongst others, setpoints, delay times, ramps ... and error diagnosis is possible via MPI (VIPA MP2I) interface, Ethernet TCP/IP, Profibus-DP or PROFINET.

Controller modules with parameter sets can be readily replaced if service is required:

- Storage of the parameter set in the CPU
- Comparison of the parameter set ID during start-up and parameter set updating

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