

Fans for Closed-Loop Control of Feed Air

SINAMICS G120P CU230P-2 from FW 4.4

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Fans for closed-loop control of feed air

SINAMICS G120P CU230P-2 from FW 4.4

Introduction

1

Connection circuit diagram

2

Script functionality

3

Description of the parameterization

4

Contact

5

History

6

Warranty and Liability

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Table of Contents

Warranty and Liability	4
1 Introduction	7
2 Connection circuit diagram	8
3 Script functionality	10
4 Description of the parameterization	11
4.1 Importing and executing the script	11
4.2 Parameterization sequence	12
4.2.1 Verifying of online status	12
4.2.2 CU module interrogation	13
4.2.3 Power module interrogation	13
4.2.4 Query, scope of the parameterization	14
4.2.5 Factory setting	15
4.2.6 Quick commissioning	15
4.2.7 Motor temperature sensing	16
4.2.8 Calculating the minimum speed	16
4.2.9 Evaluation, external belt monitoring	16
4.3 Selecting the closed-loop control type	16
4.3.1 Closed-loop temperature control	17
Application	17
Pre-connecting the PID controller	17
Actual value sensor setting	18
Sensor with voltage output	18
Sensor with current output 0 ... 20mA	18
Sensor with current output 4 ... 20mA	18
Technology standardization (Sensor with voltage/current output)	18
Ni1000 resistance thermometer	19
Pt1000 resistance thermometer	19
4.3.2 Technological unit	19
4.3.3 Closed-loop pressure control	20
Application	20
Pre-connecting the PID controller	20
Actual value sensor setting	20
Sensor with voltage output	20
Sensor with current output 0 ... 20mA	21
Sensor with current output 4 ... 20mA	21
Technology standardization	21
4.3.4 Technological unit	21
4.3.5 Closed-loop air quality control	21
Application	21
Pre-connecting the PID controller	22
Actual value sensor setting	22
Sensor with voltage output	22
Sensor with current output 0 ... 20mA	22
Sensor with current output 4 ... 20mA	22
Technology standardization	23
4.3.6 Closed-loop flow control	23
Application	23
Pre-connecting the PID controller	23
Actual value sensor setting	23
Sensor with voltage output	24
Sensor with current output 0 ... 20mA	24
Sensor with current output 4 ... 20mA	24
Technology standardization	24

Table of Contents

4.3.7	Technological unit	24
4.3.8	Configuration of the PID controller	24
4.3.9	Query - starting behaviour.....	25
4.3.10	Automatic restart	25
4.3.11	Flying restart.....	25
4.3.12	Hibernation Mode	26
	Normal control sense (closed-loop pressure and flow control)	26
	Inverse control sense (closed-loop temperature and air quality control).....	26
4.3.13	Set point input	26
	One set point	27
	Set point change	27
4.3.14	Automatic mode	28
4.3.15	Manual mode.....	28
4.3.16	Setting of the application identifier	28
	Setting the time and the date.....	29
4.3.17	Copying RAM to ROM.....	29
5	Contact.....	30
6	History.....	30

1 Introduction

In heating ventilation and air conditioning systems, feed air is the air that is fed into rooms and areas inside buildings. The feed air can be pre-treated by filtering, heating up, cooling, humidifying and dehumidifying. Depending on the control concept used, the volume flow (air) can be closed-loop controlled depending on the room temperature, the pressure in the feeder ducts, the CO₂ content in the room or also the flow rate itself.

Fans for feed air systems are either in the form of individual pieces of equipment or part of an air treatment system (HVAC system).



Fig. 1-1: Fan to feed air into a building

2 Connection circuit diagram

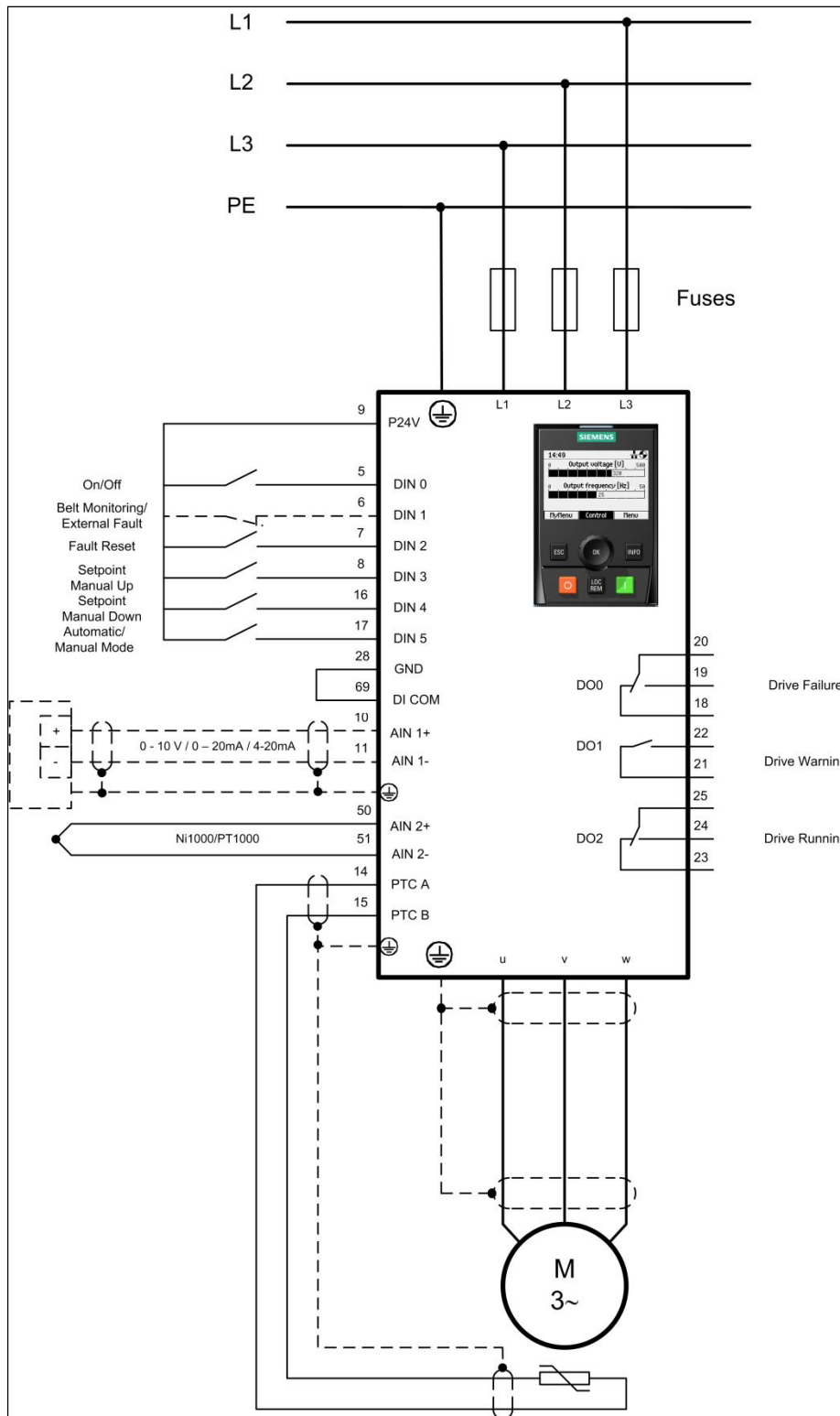


Fig. 2-1: Connection circuit diagram of the inverter

The terminal assignment for the subsequent parameterization is as follows:

DI0 – On/Off

DI1 – Optional connection of external belt monitoring

DI2 – fault acknowledgement

DI3 – Increases the set point (MOP) in manual operation

DI4 = Reduces the set point (MOP) in manual operation

DI5 – Changes over between automatic operation (closed-loop temperature control) and manual operation (open-loop controlled operation via MOP)

AI1+/- - connection for the temperature sensor (voltage/current)

AI2+/- - Connection for a resistance thermometer (**switch AI2 to TEMP**)

PTC A/B – Connection for the temperature sensor of the variable-speed fan

DO0 – Drive signal, fault

DO1 – Drive signal, alarm

DO2 – Drive signal, operation

3 Script functionality

- Check the CU module (CU230P-2) and SW Version (V4.4)
- Select between complete parameterization or subsequent set point change
- Factory setting
- Quick commissioning
- Motor temperature monitoring
- Enter the minimum speed
- Sensor selection /0 - 10V/0 - 20mA/4 – 20mA/Ni1000/Pt1000) incl. technological calibration (temperature in Degrees Celsius, pressure in Pa, air quality in ppm, flow in m³/h)
- PID controller setting
- Select automatic restart, yes/no
- Select soft starting (PID controller enable is delayed), yes/no
- Select Hibernation Mode, yes/no
- A fixed set point or two set points alternating using timer 1 and 2 (input in the technological values)
- BiCo wiring of the PID controller, the DI, DO incl. automatic/manual operation
- Only when using a PM330: Motor data identification

4 Description of the parameterization

4.1 Importing and executing the script

In order to be able to work with scripts, a script folder must first be created below the CU module in STARTER. This is done by marking the CU module ⇒ Select Expert using the right-hand mouse key ⇒ Insert script folder

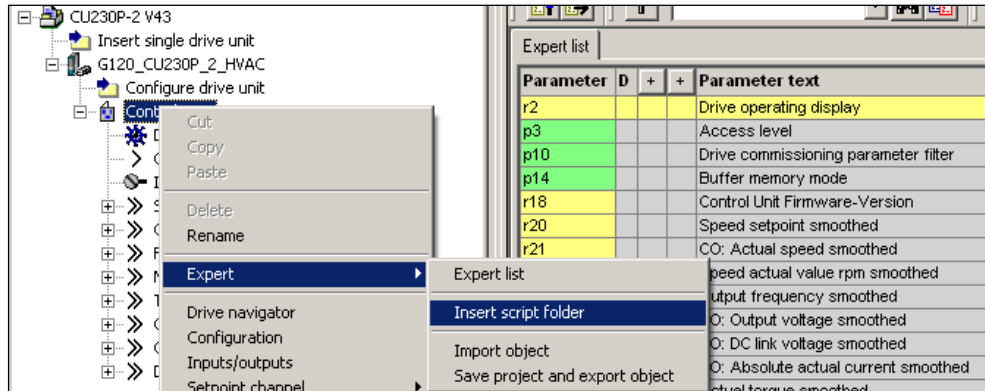


Fig. 4-1: Importing the script folder

The scripts available as text file are inserted using the "ASCII Import" link.

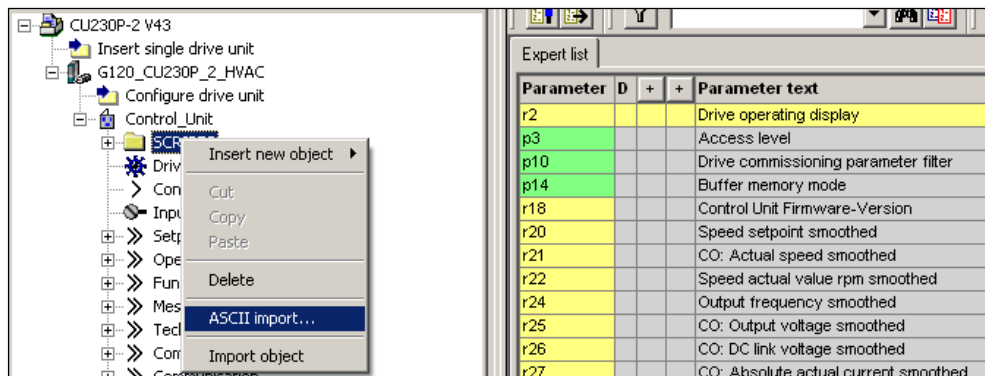


Fig. 4-2: Importing the script

When importing the script, the file manager opens with which the file to be run can be selected. The imported scripts are saved in the directory structure of the project in the Scripts folder.

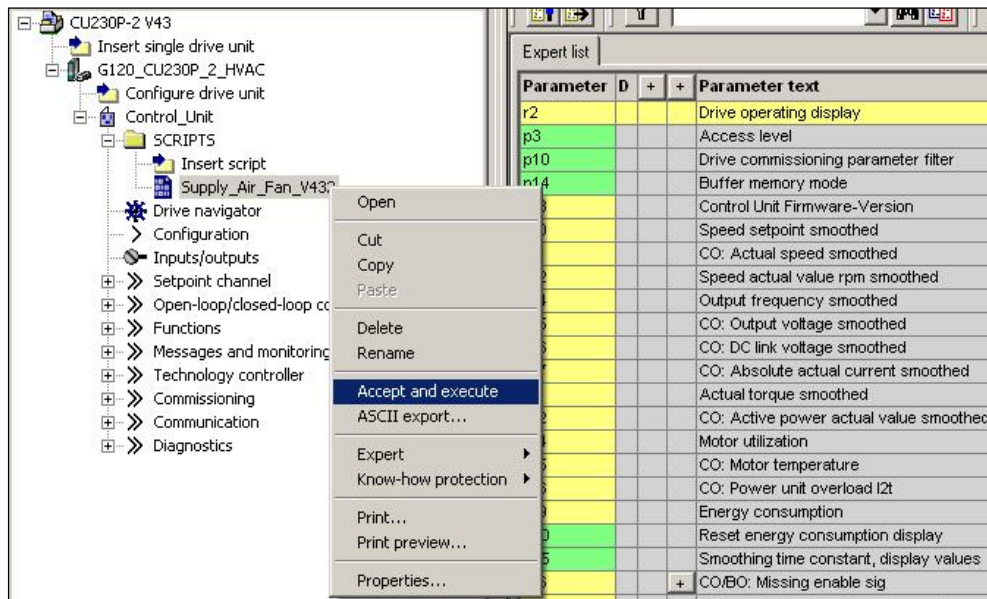


Fig. 4-3: Executing the script

The script is started by selecting the script using the right-hand mouse key and selecting "Accept and execute". The further sequence of the script is controlled using input screen forms, in which Yes/No prompts or value inputs are expected.

4.2 Parameterization sequence

The parameterization that is carried out using the script is described in the following. Most of the settings are carried out in the background, parameters shown in bold (**□□□□**) require that users make the appropriate entries.

4.2.1 Verifying of online status

This script can only run in online operation as it includes a reset to the factory setting (where the factory settings are restored) and motor commissioning.

Because of this the script tries to establish a connection to the CU if not already online. If there is still no online connection a fault message is performed.

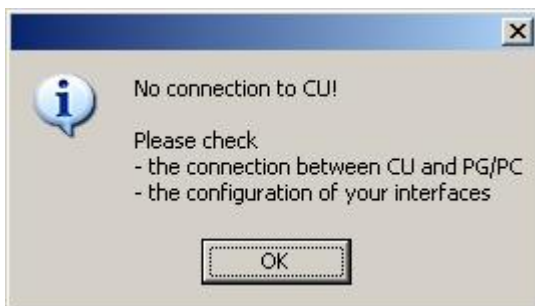


Fig. 4-4: Message no connection to CU

4.2.2 CU module interrogation

The script is only coordinated to the functionality of the CU230P-2 HVAC, CU230P-2 DP, and CU230P-2 CAN control modules; other modules are rejected.



Fig. 4-5: Message, incorrect CU module

Further, it is assumed that the module has a minimum firmware version of V4.4. For firmware version 4.3.2 exists a separate script.

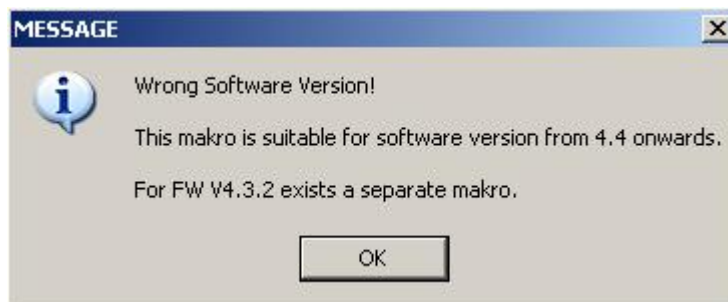


Fig. 4-6: Message, incorrect firmware version

Both of these facts are queried in the background; if they are not fulfilled, then the script is interrupted.

4.2.3 Power module interrogation

The script is not released for power module PM330 and SINAMICS G120P Cabinet drives.

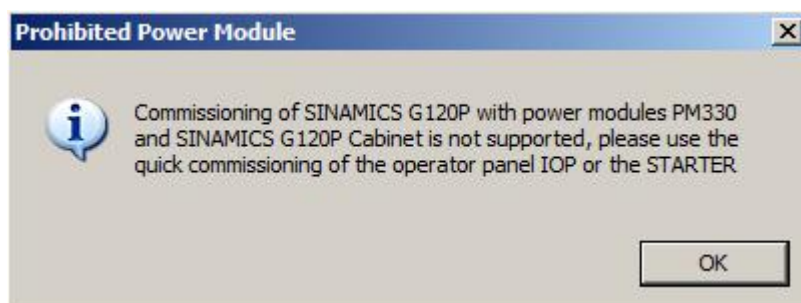


Fig. 4-7: Message, prohibited power module

4.2.4 Query, scope of the parameterization

A selection can be made as to whether the complete parameterization is run through or whether only set points and other inputs should be subsequently changed.

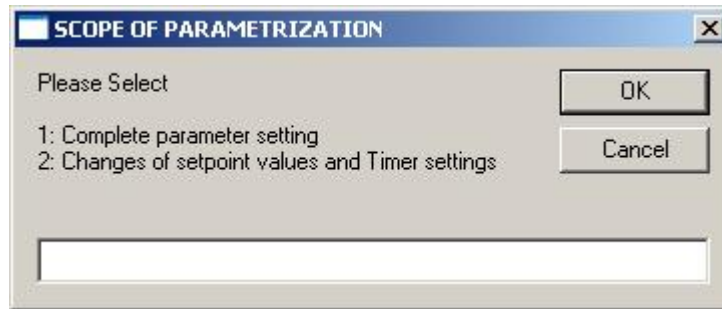


Fig. 4-8: Selection screen form, scope of parameterization

CAUTION Make sure that no On-Signal at DI-0 is active!

To finish the parameterization successful, make sure that there is no On-signal at DI-0.



Figure 4-9

In order that set points can be subsequently displayed and entered so that they are correctly technologically scaled/normalized, the maximum pressure is entered in p2900[0]. To identify the application macro, an identifier is entered into P2901[0]. Using this identifier, the script can identify that a basic parameterization was already performed.



Fig. 4-10: Message stating that the basic parameterization has not been performed

4.2.5 Factory setting

The parameterization using the script assumes that the inverter parameters are set to the values of the factory setting. Because of this the fully parameterization can only start, if factory setting is performed. In case of CU230P-2 DP the command source is changed to Terminals after the factory setting has been done.

After that in a number of parameters settings will be done. At CU230P-2 DP the connections from control word will be removed.

Parameter	Value	Comment
P0015	0	Macro drive unit
P0844[0], [1]	1	No coast-down / coast-down (OFF2)
P0852[0], [1]	1	Enable operation/inhibit operation
P0854[0], [1]	1	Control by PLC/no control by PLC
P1140[0], [1]	1	Enable ramp-function generator
P1141[0], [1]	1	Continue ramp-function generator
P1142[0], [1]	1	Enable set point
P1035[0]	0	Motorized potentiometer set point raise
P1036[0]	0	Motorized potentiometer lower set point
P1055[0], [1]	0	Jog bit 0
P1056[0], [1]	0	Jog bit 1
P1070[0]	0	Main set point
P1070[1]	0	Main set point
P1113[0], [1]	0	Set point inversion
P2103[0], [1]	0	Acknowledge faults
P2030	0	Field bus protocol selection

4.2.6 Quick commissioning

For the quick commissioning, a square-law V/f characteristic for the fans as well as a low overload factor are entered. After this, the system prompts you to enter the rated supply voltage, the rated current, the rated power and rated frequency as well as the rated speed. Depending on the motorstandard the powerfactor or the efficiency factor will be prompted. This completes the quick commissioning.

Parameter	Value	Comment
P0205	1	Load cycle with low overload
P0300[0]	1	Selects induction motor, rotary
P100	□□□□	Motorstandard
P0304[0]	□□□□	Enter rated motor voltage
P0305[0]	□□□□	Enter rated motor current
P0307[0]	□□□□	Enter rated motor power
P0308[0], P0309[0]	□□□□	Rated motor power factor or Rated motor efficiency
P0310[0]	□□□□	Enter rated motor frequency
P0311[0]	□□□□	Enter rated motor speed
P1300[0]	2	V/f characteristic with parabolic characteristic
p3900[0]	3	Completion of quick commissioning

4.2.7 Motor temperature sensing

The query allows you to select between either no sensor, PTC or KTY84. As a result of the quick commissioning, the motor over temperature is specified; for deviations, parameter P0604 can be changed.

Parameter	Value	Comment
P0601[0]	0 1 2	No sensor PTC KTY84
P0604[0]	□□□□	Enter alarm threshold, motor over temperature

4.2.8 Calculating the minimum speed

The minimum speed is set to 20% of the maximum frequency. Other values can be set.

Parameter	Value	Comment
P1080[0]	□□□□	Enter a minimum speed

4.2.9 Evaluation, external belt monitoring

Digital input 1 is provided to connect an external sensor to monitor the belt drive between the motor and fan. This function can also be deselected.

Parameter	Value	Comment
P2106[0]	r722.1	DI1 – external fault, automatic operation
P2106[1]	r722.1	DI1 – external fault, manual operation

4.3 Selecting the closed-loop control type

4 closed-loop control versions are possible to control (closed-loop) the feed air:

- Closed-loop temperature control (the fan cools the connected room/area with increased air flow rate)
- Closed-loop pressure control (the fan ensures a constant pressure in the feeder ducts)
- Closed-loop air quality control (the fan draws in the feed air depending on the CO₂ content in the connected room or area)
- Closed-loop airflow control (the fan controls the flow in the ducts)

4.3.1 Closed-loop temperature control

For closed-loop temperature control, the fan ensures a flow rate depending on the room/area temperature. The higher the temperature actual value increases above the required set point, the fan speed increases to increase the air flow to cool down the air.

Application

For closed-loop temperature control, parameter P2901[0] is set temporary to a value of 1. Because of this the script identifies that the configuration is a closed-loop temperature control.

Parameter	Value	Comment
P2901[0]	1	Identifier, not finished closed-loop temperature control

Pre-connecting the PID controller

A fixed set point is used as step-in for the PID controller. The control sense for the closed-loop temperature control is inverse, i.e. the drive operates for as long as the actual value is greater than the set point, (actual value – set point = fan speed). If the actual value is equal to or also lower than the set point, the drive operates at the minimum speed and may be switched-off as a result of the Hibernation Mode. To invert the sense of the controller, Parameter P2306 will be set to 1.

Parameter	Value	Comment
P2253[0]	r2224	Fixed set points are used
P2306	1	Technology controller fault signal inversion

Actual value sensor setting

It is possible to connect sensors with a voltage output or current output as well as Ni1000 and Pt1000 resistance thermometers.

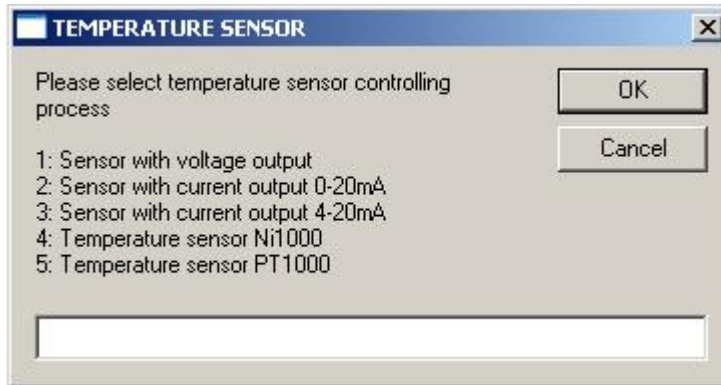


Fig. 4-11: Selection screen form, actual value sensor for the closed-loop temperature control

For sensors with a voltage output, the maximum voltage can also be entered, which is then normalized (scaled) to 100% in the set point channel (e.g. sensors with 5V output voltage are generally used). Sensors with voltage and current output are connected at analogy input AI1, Ni1000 and Pt1000 resistance thermometers are directly connected at analogue input AI2.

Sensor with voltage output

Parameter	Value	Comment
P0756[1]	0	Voltage input, unipolar (0 ... 10V)
P0759[1]	□□□□	Enter the max. output voltage

Sensor with current output 0 ... 20mA

Parameter	Value	Comment
P0756[1]	2	Current input, unipolar (0 ... 20mA)

Sensor with current output 4 ... 20mA

Parameter	Value	Comment
P0756[1]	3	Voltage input, unipolar (4 ... 20mA)

Technology standardization (Sensor with voltage/current output)

For sensors with voltage and current output the technological standardization is performed as followed. The maximum and minimum temperature that can be measured must be entered to normalize (scale) the technology values. The maximum value is saved in P2900[0] and the ratio of both in P758[1]; the set points refer to this value. An actual value smoothing of 100 ms is specified using parameter P2265. The actual value is connected from analogue input AI1.

Parameter	Value	Comment
P2900[0]	□□□□	Enter the maximum temperature that can be measured
758[1]	□□□□	Ratio of min. to max. Temp.
P2265	0.1	Time constant, actual value filter
P2264	r755[1]	Actual value from analogue input AI1

Ni1000 resistance thermometer

Parameter	Value	Comment
P0756[2]	6	Ni1000 temperature sensor
P2900[0]	100	Maximum temperature that can be measured
P2265	0.1	Time constant, actual value filter
P2264	r755[2]	Actual value from analogue input AI2

By selecting analogue input AI2 for the resistance thermometer, the inverter performs a normalization 100% = 100 Degrees Celsius. The set point is limited to 100 Degrees Celsius.

Note

Switch AI2 must be set to TEMP at the front of the CU230P-2 module.

Pt1000 resistance thermometer

Parameter	Value	Comment
P0756[2]	7	Ni1000 temperature sensor
P2900[0]	100	Maximum temperature that can be measured
P2265	0.1	Time constant, actual value filter
P2264	r755[2]	Actual value from analogue input AI2

By selecting analogue input AI2 for the resistance thermometer, the inverter performs a normalization 100% = 100 Degrees Celsius. The set point is limited to 100 Degrees Celsius.

Note

Switch AI2 must be set to TEMP at the front of the CU230P-2 module.

4.3.2 Technological unit

The technological unit P595 will be set to [°C]. The Reference quantity P596 from the technological unit will be set to the same as maximum temperature P2900.

Parameter	Value	Comment
P595	4 [°C]	Selecting technological units
P596	max temperature	Reference quantity, technological units

4.3.3 Closed-loop pressure control

For closed-loop pressure control, the fan controls the flow rate depending on the air pressure in the air feed or in the connected room or area. The control sense is normal, i.e. as the fan speed increases, the flow rate increases and in turn, the air pressure.

Application

For closed-loop pressure control, parameter P2901[0] is set temporary to a value of 2. Because of this the script identifies that the configuration is a closed-loop pressure control.

Parameter	Value	Comment
P2901[0]	2	Identifier, not finished closed-loop pressure control

Pre-connecting the PID controller

A fixed set point is used as step-in for the PID controller.

Parameter	Value	Comment
P2253[0]	r2224	Fixed set points are used

Actual value sensor setting

Sensors with voltage output or current output can be connected.

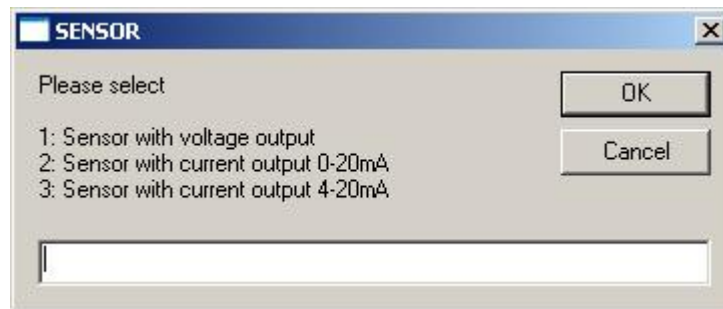


Fig. 4-12: Selection screen form, actual value sensor for the closed-loop temperature control

For sensors with a voltage output, the maximum voltage can also be entered, which is then normalized (scaled) to 100% in the set point channel (e.g. sensors with 5V output voltage are generally used). Sensors with voltage and current output are connected at analogue input AI1.

Sensor with voltage output

Parameter	Value	Comment
P0756[1]	0	Voltage input, unipolar (0 ... 10V)
P0759[1]	□□□□	Enter the max. output voltage

Sensor with current output 0 ... 20mA

Parameter	Value	Comment
P0756[1]	2	Current input, unipolar (0 ... 20mA)

Sensor with current output 4 ... 20mA

Parameter	Value	Comment
P0756[1]	3	Current input, unipolar (4 ... 20mA)

Technology standardization

The maximum pressure that can be measured in Pa must be entered to normalize (scale) the technology values. The value must be saved in P2900[0]; the set points refer to this value. An actual value smoothing of 100 ms is specified using parameter P2265. The actual value is connected from analogue input AI1.

Parameter	Value	Comment
P2900[0]	□□□□	Enters the maximum pressure that can be measured
P2265	0.1	Time constant, actual value filter
P2264	r755.1	Actual value from analogue input AI1

4.3.4 Technological unit

The technological unit P595 will be set to [Pa]. The Reference quantity P596 from the technological unit will be set to the same as maximum air pressure P2900.

Parameter	Value	Comment
P595	5 [Pa]	Selecting technological units
P596	max air pressure	Reference quantity, technological units

4.3.5 Closed-loop air quality control

For the closed-loop air quality control, the fan controls the flow rate depending on the CO₂/VOC content in the connected room or area. The control sense is inverse, i.e. with increasing fan speed and flow rate, the fan reduces the amount of pollutants in the air.

Application

For closed-loop air quality control, parameter P2901[0] is set temporary to a value of 3. Because of this the script identifies that the configuration is a closed-loop air quality control.

Parameter	Value	Comment
P2901[0]	3	Identifier, not finished closed-loop air quality control

Pre-connecting the PID controller

A fixed set point is used as set point for the PID controller. The control sense for the closed-loop temperature control is inverse, i.e. the drive operates for as long as the actual value is greater than the set point, (actual value – set point = fan speed). If the actual value is equal to or also lower than the set point, the drive operates at the minimum speed and may be switched-off as a result of the Hibernation Mode. To invert the sense of the controller, Parameter P2306 will be set to 1.

Parameter	Value	Comment
P2253[0]	r2224	Using fixed value effective
P2306	1	Technology controller fault signal inversion

Actual value sensor setting

Sensors with voltage output or current output can be connected.

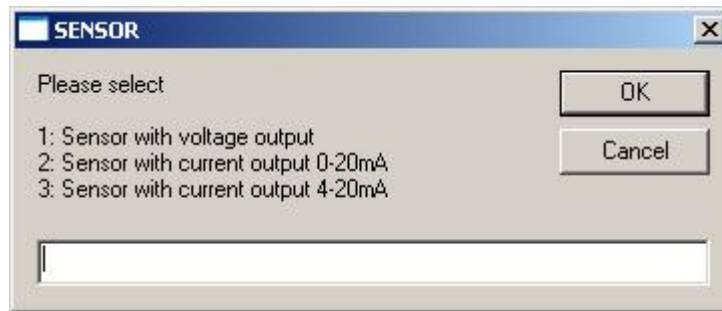


Fig. 4-13: Selection screen form, actual value sensor for the closed-loop temperature control

For sensors with a voltage output, the maximum voltage can also be entered, which is then normalized (scaled) to 100% in the set point channel (e.g. sensors with 5V output voltage are generally used). Sensors with voltage and current output are connected at analogue input AI1.

Sensor with voltage output

Parameter	Value	Comment
P0756[1]	0	Voltage input, unipolar (0 ... 10V)
P0759[1]	□□□□	Enter the max. output voltage

Sensor with current output 0 ... 20mA

Parameter	Value	Comment
P0756[1]	2	Current input, unipolar (0 ... 20mA)

Sensor with current output 4 ... 20mA

Parameter	Value	Comment
P0756[1]	3	Voltage input, unipolar (4 ... 20mA)

Technology standardization

The maximum CO2 content that can be measured in ppm must be entered to normalize (scale) the technology values. The value must be saved in P2900[0]; the set points refer to this value. An actual value smoothing of 100 ms is specified using parameter P2265. The actual value is connected from analogue input AI1.

Parameter	Value	Comment
P2900[0]	□□□□	Enters the maximum pressure that can be measured
P2265	0.1	Time constant, actual value filter
P2264	r755.1	Actual value from analogue input AI1

4.3.6 Closed-loop flow control

For closed-loop flow control, the fan controls the flow rate as a function of the flow in the air feed or in the connected room or area. The control sense is normal, i.e. with increasing fan speed, the volumetric flow increases and therefore the flow.

Application

For closed-loop flow control, parameter P2901[0] is set temporary to a value of 4. Because of this the script identifies that the configuration is a closed-loop flow control.

Parameter	Value	Comment
P2901[0]	4	Identifier, not finished closed-loop flow control

Pre-connecting the PID controller

A fixed set point is used as set point for the PID controller.

Parameter	Value	Comment
P2253[0]	r2224	Fixed set points are used

Actual value sensor setting

Sensors with voltage output or current output can be connected.

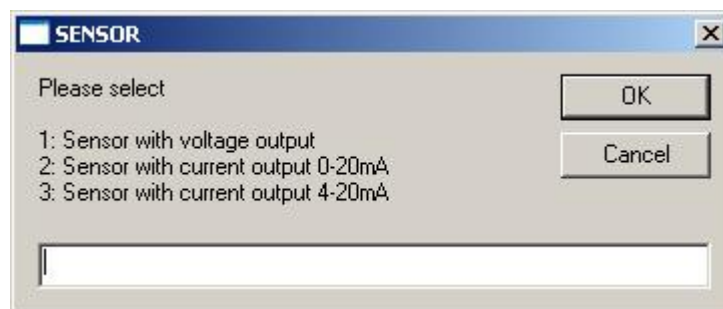


Fig. 4-14: Selection screen form, actual value sensor for the closed-loop temperature control

For sensors with a voltage output, the maximum voltage can also be entered, which is then normalized (scaled) to 100% in the set point channel (e.g. sensors with 5V output voltage are generally used). Sensors with voltage and current output are connected at analogue input AI1.

Sensor with voltage output

Parameter	Value	Comment
P0756[1]	0	Voltage input, unipolar (0 ... 10V)
P0759[1]	□□□□	Enter the max. output voltage

Sensor with current output 0 ... 20mA

Parameter	Value	Comment
P0756[1]	2	Current input, unipolar (0 ... 20mA)

Sensor with current output 4 ... 20mA

Parameter	Value	Comment
P0756[1]	3	Voltage input, unipolar (4 ... 20mA)

Technology standardization

The maximum flow that can be measured in m³/h must be entered to normalize (scale) the technology values. The value must be saved in P2900[0]; the set points refer to this value. An actual value smoothing of 100 ms is specified using parameter P2265. The actual value is connected from analogue input AI1.

Parameter	Value	Comment
P2900[0]	□□□□	Enters the maximum pressure that can be measured
P2265	0.1	Time constant, actual value filter
P2264	r755[1]	Actual value from analogue input AI1

4.3.7 Technological unit

The technological unit P595 will be set to [m³/h]. The Reference quantity P596 from the technological unit will be set to the same as maximum flow P2900.

Parameter	Value	Comment
P595	11 [m ³ /h]	Selecting technological units
P596	max flow	Reference quantity, technological units

4.3.8 Configuration of the PID controller

The PID controller is interconnected as main set point. The actual value is connected from analogue input AI1. Fans are only operated with a positive direction of rotation. This is the reason that the PID controller limiting is set from 0% to 100%. Three windows are opened one after the other to input the gain factor, the integral time as well as the derivative action time.

Parameter	Value	Comment
P2200[0]	1	Enables the PID controller
P2251	0	Technology controller as main set point
P2297	p2291	Value, positive limit
P2298	p2292	Value, negative limit
P2280	□□□□	Enter the proportional gain
P2285	□□□□	Enter the integral time
P2274	□□□□	Enter the differentiating time

4.3.9 Query - starting behaviour

A distinction can be made between immediately enabling the PID controller when switching-on the drive and soft starting; in this case, the PID controller output is opened using an up ramp that can be set.

Parameter	Value	Comment
P2293	□□□□	Technology controller, ramp-up/ramp-down time in sec

4.3.10 Automatic restart

It is possible to select an automatic restart after power failure.

Parameter	Value	Comment
P1210	4	Restart after power failure

NOTE

This value can only be changed in a status without faults, because of this an automatic fault acknowledge is performed. If the fault message is still active a warning message will appear and the script will go on without activating this function.

4.3.11 Flying restart

It is possible to combine the restart after power failure with the flying restart. Search in the set point direction is preset (default setting).

Parameter	Value	Comment
P1200	4	Flying restart active (search in the set point direction)

4.3.12 Hibernation Mode

Normal control sense (closed-loop pressure and flow control)

The Hibernation Mode ensures that the inverter switches itself off if the actual value is greater than the set point for a specific time. The PID controller also remains active with the inverter switched-off. The delay time can be set as to how long the fan operates at the minimum frequency before it is switched off. The restart value is used to set the accuracy with which the inverter is switched-on again if the actual value again drops below the set point. Low setting values in the range of several percent result in a quite narrow switch-in bandwidth; high setting values in the range greater than 10% mean that the actual value drops more before the drive is switched-in again.

Inverse control sense (closed-loop temperature and air quality control)

The Hibernation Mode ensures that the inverter switches itself off if the actual value is less than the set point for a specific time. The PID controller also remains active with the inverter switched-off. The delay time can be set as to how long the fan operates at the minimum frequency before it is switched off. The restart value is used to set the accuracy with which the inverter is switched-on again if the actual value again rises above the set point. Low setting values in the range of several percent result in a quite narrow switch-in bandwidth; high setting values in the range greater than 10% mean that the actual value rises more before the drive is switched-in again.

Parameter	Value	Comment
P2398	1	Hibernation Mode activated
P2391[0]	<input type="text"/>	Enter the hibernation delay time
P2392	<input type="text"/>	Enter the hibernation restart value

4.3.13 Set point input

The set point is entered in technological values.

- Closed-loop temperature control, Degrees Celsius
- Closed-loop pressure control, Pa
- Closed-loop air quality control, ppm
- Closed-loop flow control, m³/h

As a result of the normalization (scaling of the actual value), the value is converted into a percentage and is then entered as fixed set point. If a value is entered, which is greater than the maximum possible actual value, then value is rejected - and the input screen form is redisplayed. It is possible to only select one set point; using the timer, a changeover can then be made between two set points in a time-controlled fashion. If there is a gap between the timers where no set point is active, the drive will be switched off in this time.

One set point

Parameter	Value	Comment
P2201[0]	□□□□	Technology controller, fixed value 1
P2216	1	Fixed value direct selection
P840[0]	r722.0	DI0 - Drive ON/OFF
P2220[0]	1	Fixed value selection, bit 0

Set point change

Parameter	Value	Comment
P2201[0]	□□□□	Technology controller, fixed value 1
P2202[0]	□	Technology controller, fixed value 2
P2216	1	Fixed value direct selection
P8410[0]	1	Activation, weekday time switch 1
P8410[1]	1	Activation, weekday time switch 1
P8410[2]	1	Activation, weekday time switch 1
P8410[3]	1	Activation, weekday time switch 1
P8410[4]	1	Activation, weekday time switch 1
P8410[5]	1	Activation, weekday time switch 1
P8410[6]	1	Activation, weekday time switch 1
P8420[0]	1	Activation, weekday time switch 2
P8420[1]	1	Activation, weekday time switch 2
P8420[2]	1	Activation, weekday time switch 2
P8420[3]	1	Activation, weekday time switch 2
P8420[4]	1	Activation, weekday time switch 2
P8420[5]	1	Activation, weekday time switch 2
P8420[6]	1	Activation, weekday time switch 2
P8411[0]	□□□□	Switch-on time, time switch - 1 hour
P8411[1]	□□□□	Switch-on time, time switch - 1 minute
P8412[0]	□□□□	Switch-off time, time switch - 1 hour
P8412[1]	□□□□	Switch-off time, time switch - 1 minute
P8421[0]	□□□□	Switch-on time, time switch - 2 hours
P8421[1]	□□□□	Switch-on time, time switch - 2 minutes
P8422[0]	□□□□	Switch-off time, time switch - 2 hours
P8422[1]	□□□□	Switch-off time, time switch - 2 minutes
P20030[0]	r722.0	AND 0 Input, Input I0 – DI0
P20030[1]	r2225.0	AND 0 Input, Input I1 – Fixed value active
P20030[2]	1	AND 0 Input, Input I2 – 1
P20030[3]	1	AND 0 Input, Input I3 – 1
P20032	5	AND 0 Run time group
P840[0]	r20031	Ein/Aus1
P2220[0]	r8413.0	Selection, fixed value 1 using time switch 1
P2221[0]	r8423.0	Selection, fixed value 2 using time switch 2

4.3.14 Automatic mode

In the automatic mode, the fan is operated with closed-loop control using the PID controller depending on the required control version; the set points are saved as fixed set points. Depending on the selection, the drive operates with the Hibernation Mode

Parameter	Value	Comment
P20030[0]	r722.0	DI0 - AND 0 Input Drive on (time-dependent)
P2106[0]	r722.1	DI1 – External Fault (dry running protection)
P2104[0]	r722.2	DI2 - Fault acknowledgement
P810	r722.5	DI5 - CDS0/1 changeover

4.3.15 Manual mode

The drive can be switched over from the automatic into the manual mode using DI5. In the manual mode, the PID controller is not operational, with DI3 and DI4, the motorized potentiometer, which is used as set point source, is controlled either higher or lower. The initial value of the motorized potentiometer is set to the minimum frequency, the maximum value to the maximum frequency.

Parameter	Value	Comment
P840[1]	r722.0	DI0 - Drive ON/OFF
P2106[1]	r722.1	DI1 - External fault (dry running protection)
P2104[1]	r722.2	DI2 - Fault acknowledgement
P1035[1]	r722.3	DI3 - Set point, increase (raise)
P1036[1]	r722.4	DI4 - Set point, decrease (lower)
P810[1]	r722.5	DI5 - CDS0/1 changeover
P2200[1]	0	Inhibit PID controller
P1070[1]	1050	Main set point MOP
P1038[1]	p1080[0]	Motorized potentiometer, minimum speed
P1037[1]	p1082[0]	Motorized potentiometer, maximum speed
P1040[1]	p1080[0]	Start speed, motorized potentiometer

4.3.16 Setting of the application identifier

The identifier of the application identifier is completed as a sign of the finished script. The application identifier is the addition of 100, the common identifier of the air supply and the already in P2901 existing identifier of the closed-loop control type.

Parameter	Value	Comment
P2901[1]	101	closed-loop temperature control
	102	closed-loop pressure control
	103	closed-loop air quality control
	104	closed-loop air flow control

Setting the time and the date

The internal real-time clock is set to the time and date of the PC.

Parameter	Value	Comment
P8400[0]	□□□□	RTC time, hour
P8400[1]	□□□□	RTC time, minute
P8400[2]	□□□□	RTC time, second
P8401[0]	□□□□	RTC date, day
P8401[1]	□□□□	RTC date, month
P8401[2]	□□□□	RTC date, year



Fig. 4-15: Message, system time was set

4.3.17 Copying RAM to ROM

When parameterization has been completed, data is backed-up by copying from RAM to ROM.



Fig. 4-16: Message, save parameterization

5 Contact

Siemens AG
Industry Sector
I DT MC PMA APC
Frauenauracher Straße 80
D - 91056 Erlangen
mailto: tech.team.motioncontrol@siemens.com

6 History

Tabelle 6-1

Version	Datum	Änderung
V1.0	11/2010	First Edition
V1.1	02/2011	Changes on documentation
V1.2	05/2011	Changes on script
V1.3	05/2012	Revision for FW4.4
V1.4	04/2014	Vectorcontrol for PM330 added
V1.5	11/2014	Power module interrogation