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FLOOR HEATING / - COOLING CONTROLLER HLS 16

HLS 16 is a 1-step floor heating / cooling controller for individual room temperature controlling. Both heating and cooling will be controlled by using the same thermal actuator and by changing the direction of function with the external contact connected to the terminal Z1. (Z1= off = heating or Z1=Go=cooling)

Room temperature will be detected by an internal NTC10 sensor. The output, controlling heating (red light) and cooling (green light), is proportional to the difference between set point and measured value.

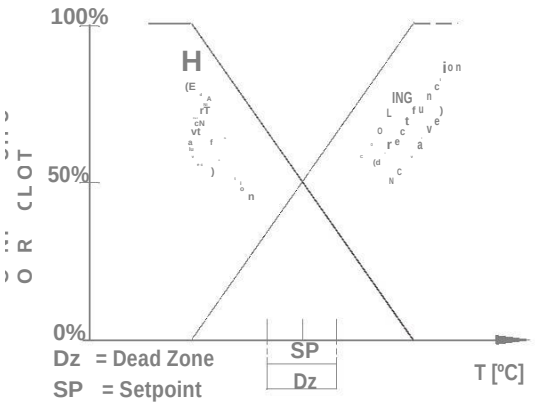
The mid point of the set point (factory setting = 21 °C) can be changed by setting the potentiometer to the desired position and by opening and closing jumper S3. Proportional band of 1°C (S2=off) or 2°C (S2=on) will be selected by the jumper S2.

Only thermal actuators can be used with HLS 16 controlling them time proportionally in sequences of about 20 s. Either NC or NC actuators can be used connected to either A1 or A2 terminals.

Normally the display of HLS 16-N indicates the detected value, but when the setting has been changed it will be indicated for 2 s.

Controllers of HLS -series can be used in dry surroundings mounted on the wall surface or on the standard flush mounting boxes with a 60 mm fixing screw hole distance.

Function



Technical data:

supply		24Vac (20…28V) / 1 VA
set point		18…24, +/- 3 °C, *21 °C
measuring error		+/- 0,5 °C
dead zone	Dz	0…3 °C, *0,0 °C
proportional band	Xp	1 °C or *2 °C
outputs A1 and A2		24Vac 1A
allowed ambient humidity		0...85 % RH (non-condensing)
terminals		1,5 mm²
casing		ABS-plastics, IP20
		* = factory settings

Wiring:

G	supply 24Vac
Go	0 V
A1	output for NC valve (= direct function)
A2	output for NO valve (= reverse function)
Z1	winter=heating / summer=cooling selection; when Z1=Go, is cooling on

Ordering guide:

Model	Product number	Description
HLS 16	1150160	floor heating / cooling controller
HLS 16-N	1150161	floor heating / cooling controller with display

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ZONE TEMPERATURE CONTROLLER HLS 21

HLS 21 is a two stage controller for individual room and zone temperature control applications. There is one thermic actuator stage for both cooling and heating.

Temperature is detected by the internal (or external) NTC 10 sensor. The space temperature is maintained at the set point by modulating the position of the actuator to meet the cooling (green light) or heating (red light) demand. The dead zone (no red or green light) between heating and cooling is adjustable (0…3°C).

The controller supports thermal actuators that are controlled by using 20 s pulse width modulation. The cooling mode can be disabled by connecting Z1=Go by using the external switch.

The display normally shows the measured temperature. When the settings are adjusted, the display automatically shows that value for approximately 2 seconds.

Controller can be used in dry surroundings mounted on the wall surface or on the standard flush mounting box (60 mm hole distance).

Coding:

S1	Valve jam prevention	■	Valve jam prevention on
		▭	Valve jam prevention off
S2	Proportional band (Xp)	■	2 °C
		▭	1 °C
S3	Centre of user set point area	The user set point area centre (factory setting 21 °C) can be changed by turning the potentiometer to the desired position and then removing and replacing the jumper.	

Technical data:

Supply		24 Vac (20…26 V) / 2 VA
Set point		18…24 °C, ±3 °C, *21 °C
Accuracy		±0,5 °C
Dead zone	Dz	0…3 °C, *0,2 °C
P-band	Xp	1 °C or *2 °C
Outputs A1 and A2		24 Vac, 1 A
Allowed ambient humidity		0...85 % RH (non cond.)
Terminals		1,5 mm²
Housing		ABS-plastics, IP20
		* = factory setting

Wiring:

G	24 Vac
Go	0 V
A1	Cooling output
A2	Heating output
Z1	as Z1=Go, cooling is disabled
EXT	External NTC 10 temperature sensor (only EXT models)

Ordering guide:

Model	Product number	Description
HLS 21	1150100	temperature controller with an internal sensor
HLS 21-N	1150101	temperature controller with an internal sensor and with display
HLS 21-EXT	1150102	terminals for external NTC 10 sensor
HLS 21-N-EXT	1150103	temperature controller with internal display and with terminals for external NTC 10 sensor

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ROOM CONTROLLER HLS 33

HLS 33 is designed for two or three stage room control applications. The controller has one stage for heating and two stages for cooling.

The temperature is measured with internal (or external) NTC 10 sensor. The controller controls the heating (indicator light is red) or cooling (indicator light is green) actuators according to the measured temperature and the set point. The dead zone (indicator light is off) between heating and cooling stages is adjustable (0…3 °C). The controller function (outputs) can be changed reverse.

The actuators can be 0…10 V controlled motors and either 3- point or thermal actuators. The thermal output signal is time proportional and uses 20 second (PWM) pulses.

One cooling stage is controlled with 0…10 V signal and the other stage is controlled either with 3-point or thermal actuator control.

The cooling can be prevented by connecting Z1=Go with an external switch.

Normally, the current temperature is shown on the display. When changing the set point, the set point value is shown on the display for two seconds.

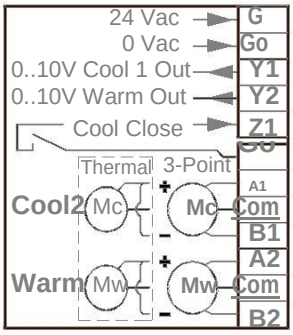
Controller can be used in dry surroundings mounted on the wall surface or on the standard flush mounting boxes (60 mm hole distance).

NOTE: The jumper settings must only be changed when the controller is disconnected from the power supply.

Codings

S1	Cooling	Dir	■
	Output	Rev	■
S2	Warming	Dir	■
	Output	Rev	■
S3	P / PI	PI	■
	Control	P	■
S4	Actuator	3-Point	■
	Mc,Mw	Thermal	■
S5	Cooling	1-stage	■
	function	2-stage	■
S6	2-stage	Cool1 first	■
	Cooling	Cool2 first	■

Wiring



The external NTC 10 sensor of the EXT models is connected to the terminals below the potentiometer.

Technical data

Supply		24 Vac (20…26 V) / 2 VA
Set point		18…26 °C, *21 °C, ±3 °C
Accuracy		±0.5 °C
Dead zone	Dz	0…3 °C, *1,5 °C
Proportional band	Xp	1…8 °C, *4 °C
Integration time	Tn	50…500 s, *300 s
3-point control actuator running time	Mt	30…300 s, *180 s
Outputs Y1 and Y2		0…10 V / 10…0 V, 2 mA
Outputs A1 and A2		3-point motor, 24 Vac 1 A thermal actuator, 24 Vac 1 A
Allowed ambient humidity		0...85 % RH (non cond.)
Wiring terminals		1,5 mm²
Housing		ABS plastic, IP20
		* = Factory setting

Ordering guide:

Model	Product number	Description
HLS 33	1150090	room temperature controller; internal sensor
HLS 33-N	1150091	room temperature controller with display; internal sensor
HLS 33-EXT	1150092	room temperature controller; terminals for external NTC 10 sensor
HLS 33-EXT-N	1150093	room temperature controller with display; terminals for external NTC 10 sensor

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ROOM TEMPERATURE CONTROLLER HLS 34

The HLS34 is specifically designed for individual room temperature and zone control applications. The HLS 34 controller has built-in RS-485 channel for Modbus communication. Controllers can be connected to any supervisory software / system supporting Modbus RTU.

The HLS34 has built-in display and unique touch sensitive buttons for adjusting the user parameters and for configuring the controller.

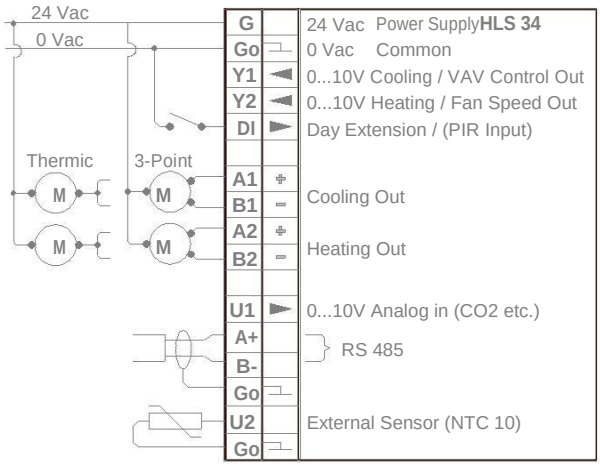
This controller supports 0...10V actuators, 3-point controlled actuators and thermic actuators.

One of the 0…10Vdc outputs of the controller can be configured for a fan speed control via FCRY3 relay module or it can be used for VAV control.

The controller has DAY and NIGHT operating modes. When in the NIGHT mode the controller can be overridden to the DAY mode via a hardware input or by touching day extension button or via the MODBUS network. Return to NIGHT mode is automatic after pre-set delay.

The controller has also a CO2 measurement input for boosting the ventilation (fan speed) in case of high CO2 level in the room space.

Wiring:



Technical data:

supply		24Vac/dc (20…26V) < 1 VA Note! When using dc supply only 0-10V outputs are operational
set point		day mode:21°C, *+/- 3°C, *21°C night mode: 5-20°C, *18°C
accuracy		+/- 0,5 °C
dead zone Dz		day mode: 0…3 °C, *0,3 °C night mode: 0…10 °C
P-band	Xp	1…32 °C, *2 °C
integration time	Tn	50…5000 s, *300 s
3-point act. running time	Mt	30…300 s, *180 s
outputs Y1 and Y2		0…10V, 2mA
outputs A1/B1 and A2/B2 selectable by commissioning		3-point actuator, 24Vac 1A or thermic actuator 24Vac 1A
allowed ambient humidity		0...85 % RH (non-condensive)
wiring terminals		1,5 mm²
housing		ABS-plastics, IP20
dimensions w x h x d		87 x 86 x 32 mm

* = factory setting

Ordering guide:

Model	Product number	Description
HLS 34	1150110	room temp. controller with MOD-bus communication
FCRY 3	1183070	fan coil relay with a 0-10V input
HLS 34-SER	1150111	configuration tool

HLS 34-SER Handheld Configuration Tool

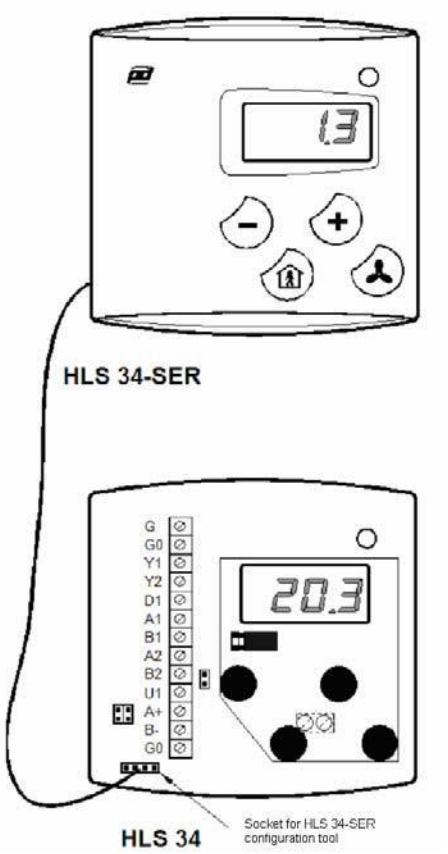
NOTE! HLS 34 controller must be disconnected from the Modbus during feeding the data.

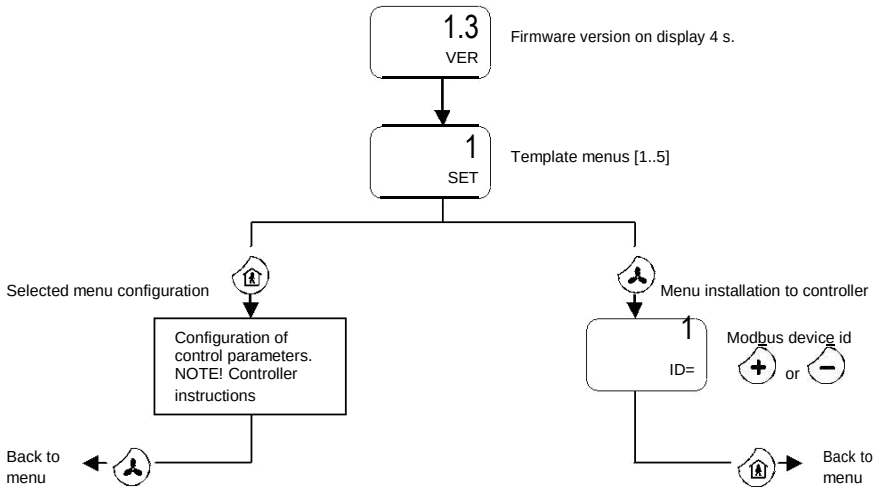
Commissioning of HLS 34 controllers can easily be done by using HLS 34-SER configuration tool.
The versions of software must be equal at the controller and tool (e.g. Ver 1.3).

HLS 34-SER configuration tool may include five different controller configurations.

After removing the cover HLS 34-SER can be connected to the configuration socket of HLS 34 controller (see the picture).
The supply of HLS 34-SER will come via the configuration socket of HLS34 controller.
The first information at the display of configuration tool, after connecting to the controller, is the version number of the software (Must be equal to controller).

We recommend careful planning and setting the configurations to the configuration tool before feeding the data to the controllers.
HLS 34 controllers can be configured on the field during commissioning or in advance before installation in the office.





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HLS 35 FLOOR HEATING / COOLING CONTROLLER

The HLS 35 is made for individual room floor heating / cooling applications, especially for buildings where, in the summer time, heating water can be changed to cooling water. Electric boiler may be the heating source. HLS 35 controllers have built-in RS-485 channels for Modbus communications and they can be connected to any supervisory software / system supporting Modbus RTU.

The HLS35 has a built-in display and unique touch sensitive buttons for adjusting the user parameters and for configuring the controller.

HLS 35 controllers support using of 0...10V actuators, and also using of 3-point controlled or thermal (PWM) actuators.

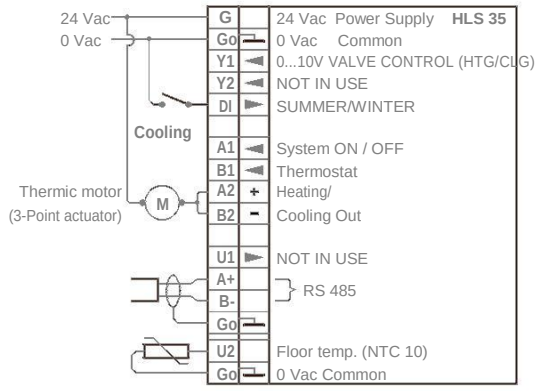
HLS 35 has two sensor inputs, internal and external. When the internal sensor is a master sensor, is the external sensor working like a restricting sensor, limiting either highest or lowest temperatures. Convenient floor surface temperature remains, as the minimum temperature is limited and the floor covering damages will be avoided, as the maximum temperature is limited. Restricting features are not available, if the external sensor is working like a master sensor.

External floor temperature sensor can be connected to the controller for limiting minimum temperature and to maintain convenient surface temperature of the floor.

The controller has DAY and NIGHT operating modes set via Modbus. When in the NIGHT mode, the controller can be overridden to the DAY mode via a hardware input by touching day extension button or via the MODBUS network. Return to NIGHT mode is automatic after pre-set delay.

Controllers of HLS -series can be used in dry surroundings mounted on the wall surface or on the standard flush mounting boxes with a 60 mm fixing screw hole distance.

Wiring:



Technical data:

supply		24Vac/dc (20…26V) < 1 VA Note! When using dc supply only 0-10V outputs are operational
inputs		1 x NTC10 return water temp. 1 x digital (summer / winter)
output Y1		0…10V, 2mA
A2/B2, selectable by commissioning		3-point actuator, 24Vac 1A or thermal actuator 24Vac 1A
output A1 = OFF = ON		when controller is inside of Dz when controller is outside of Dz
output B1		thermostat output
set point for room		day mode:21°C, *+/- 3°C, *21°C night mode: 5-20°C, *17°C
set point for floor		0…50°C, *21°C
accuracy		+/- 0,5 °C
dead zone	Dz	day mode: 0…3 °C, *0 °C night mode: 0…10 °C, *6°C
P-band	Xp	1…32 °C, *2 °C
integration time	Tn	50…5000 s, *300 s
3-point act. running time Mt		30…300 s, *180 s
allowed ambient humidity		0...85 % RH (non-condensive)
wiring terminals		1,5 mm²
housing		ABS-plastics, IP20
dimensions w x h x d		87 x 86 x 32 mm
		* = factory setting

Ordering guide:

Model	Product number	Description
HLS 35	1150130	floor heating controller with MOD-bus communication
TEL NTC 10	1175280	floor temperature sensor

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HLS 44 ROOM CONTROLLER

HLS 44 is a versatile room controller for individual room temperature and VAV control applications. The controller can be connected to any system that supports Modbus RTU protocol by using the RS- 485 connection. The bus is galvanically isolated from the controller's other electronics.

Controller supports 0...10 V controlled actuators and/or thermal actuators and 0…10 V controlled dampers. The fan coil fan speed can be controlled directly with a 0…10 V output if the fan coil is equipped with EC motor. FCRY 3 relay module is needed for controlling the fan speed of 3-step motors.

There is one 0…10 V output reserved for variable air volume control. A demand based and energy saving ventilation can be implemented with a separate carbon dioxide measurement connected to the U1 input.

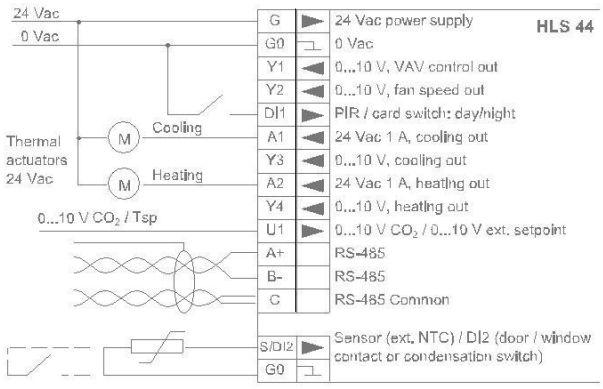
Temperature is detected with an internal or external NTC10 sensor (terminals included). Alternatively the external temperature sensor terminals can be used for connecting door/window contact or condensation switch.

The controller has day and night operating modes. The operating modes can be controlled by an external card switch, PIR occupancy detector, over Modbus and from menu. The day mode can be activated temporarily for a specific time by touching the "man in house" button. The temporary time can be 1...480 min. After that delay, the controller returns to the night mode if the day mode is not simultaneously activated over the Modbus.

Controller can be used in dry surroundings mounted on the wall surface or on the standard flush mounting boxes (60 mm hole distance).

The controller settings can be supplied with controller buttons or by using the HLS 44-SER commissioning tool which speeds up the commissioning.

Wiring:



Technical data

Supply	24 Vac/dc** (20…28 V), < 1 VA
Set point - day mode - night mode	18…26 °C, *21 °C, ±3 °C Frost protection 8…50 °C, *17 °C ±0.5 °C
Accuracy (measuring inaccuracy)	
Dead zone Dz	in day mode 0,2…3 °C, *0,2 °C in night mode 0…10 °C, *6,0 °C
Proportional band Xp	1…32 °C, *1 °C
Integration time Tn	50…5000 s, *300 s
Outputs	4 x 0…10 V, 2 mA 2 x triac output 24 Vac 1A for thermal actuators
Allowed ambient humidity	0...85 % rH (non-condensing)
Wiring terminals	1,5 mm²
Housing	ABS plastic, IP20
Dimensions (w x h x d)	87 x 86 x 32 mm

* Factory setting
** **NOTE:** Only the 0...10 V outputs work when using DC supply voltage.

Ordering guide:

Model	Product number	Description
HLS 44	1150250	Modbus room controller
FCRY 3	1183070	fan coil relay with a 0...10 V input
HLS 44-SER	1150251	commissioning tool for HLS 44

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HLS 44-V ROOM CONTROLLER WITH LIGHTS CONTROL

HLS 44-V is a versatile room controller for individual room temperature and VAV control applications. The controller can be connected to any system that supports Modbus RTU protocol by using the RS- 485 connection. The bus is galvanically isolated from the controller's other electronics.

Controller supports 0...10 V controlled actuators and/or thermal actuators. The fan coil fan speed can be controlled directly with a 0…10 V output if the fan coil is equipped with EC motor. FCRY 3 relay module is needed for controlling the fan speed of 3-step motors.

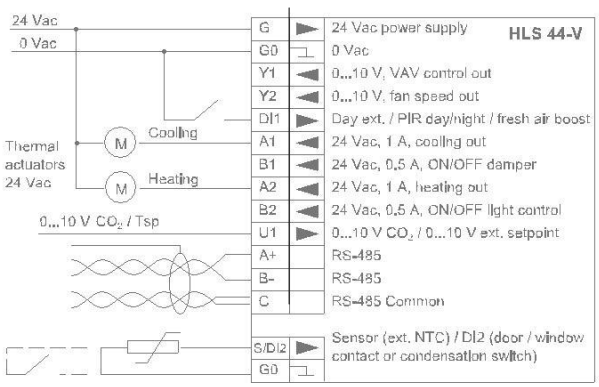
Fresh air supply can be controlled in two ways: with ON/OFF type damper or by controlling the damper motor or variable air volume control with the 0…10 V output. A demand based and energy saving ventilation can be implemented with a separate carbon dioxide measurement connected to the U1 input.

Temperature is detected with an internal or external NTC10 sensor (terminals included). Alternatively the external temperature sensor terminals can be used for connecting door/window contact or condensation switch.

The controller has day and night operating modes. The operating modes can be controlled by an external card switch, PIR occupancy detector, over Modbus and from menu. The day mode can be activated temporarily for a specific time by touching the "man in house" button. The temporary time can be 1...480 min. After that delay, the controller returns to the night mode if the day mode is not simultaneously activated over the Modbus.

Controller can be used in dry surroundings mounted on the wall surface or on the standard flush mounting boxes (60 mm hole distance).

The controller settings can be supplied with controller buttons or by using the HLS 44-SER commissioning tool which speeds up the commissioning.



Technical data

Supply		24 Vac/dc** (20…28 V), < 1 VA
Set point	- day mode	18…26 °C, *21 °C, ±3 °C
	- night mode	Frost protection 8…50 °C, *17 °C ±0.5 °C
Accuracy (measuring inaccuracy)		
Dead zone	Dz	in day mode 0,2…3 °C, *0,2 °C in night mode 0…10 °C, *6,0 °C
Proportional band	Xp	1…32 °C, *1 °C
Integration time	Tn	50…5000 s, *300 s
Outputs		2 x 0…10 V, 2 mA 2 x triac output 24 Vac 1A for thermal actuators 2 x triac output 24 Vac 0,5 A ON/OFF control (damper and lights)
Allowed ambient humidity		0...85 % rH (non-condensing)
Wiring terminals		1,5 mm²
Housing		ABS plastic, IP20
Dimensions (w x h x d)		87 x 86 x 32 mm

* Factory setting
** **NOTE:** Only the 0...10 V outputs work when using DC supply voltage.

Ordering guide:

Model	Product number	Description
HLS 44-V	1150260	fan coil and VAV controller; Modbus communication
FCRY 3	1183070	fan coil relay with a 0...10 V input
HLS 44-SER	1150251	commissioning tool for HLS 44
RYVA 16	1183060	relay for lights 230 Vac, 16 A

NOTE: The controller is available also with various button configurations.