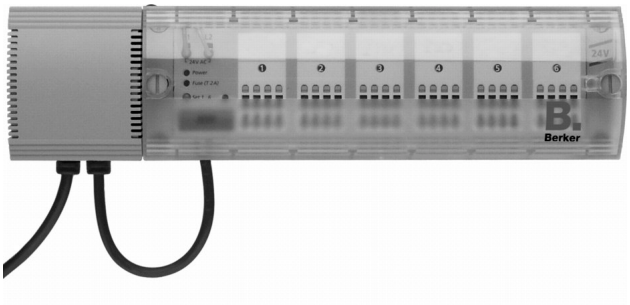
Heating actuator 6gang Triac 24 V 75336001

Technical documentation



The heating actuator 6gang Triac, 24 V can be used to control 24V thermic valve drives.

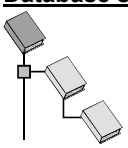
It can control up to 6 rooms via a maximum of 4 thermic valve drives per channel.

The maximum number of connected valve drives is 13.

The following functions are available:

- Selection per channel of the method of operation between switching and continuous regulation.
- Monitoring of the “manipulated variable” objects: if there is no manipulated variable, an emergency program is started.
- Possibility of overriding the manipulated variable via the “forced guidance operation“ objects.
- The heating actuator is deactivated via the “Summer operation” object.
- If required, a valve protection program can be carried out in summer operation.
- Determining of the maximum continuous manipulated variable for the flow pipe temperature control of a boiler.
- Automatic unlocking of the thermic valve drives after switching ON.

Database structure:



Gebr. Berker
Heating, air condition
Heating actuator

Application overview:

6/12 outputs for valve drives

Characteristics:

- User-friendly heating regulation in connection with the various EIB thermostats
- Triac outputs mean silent switching
- Emergency program if the manipulated variable fails (e.g. if EIB thermostat is defective or fails)
- All outputs are protected against short circuits and overloading.
- Design is especially suitable for heating circuit distributors (touchable protective low voltage)
- Plug-in terminal technology means fast, easy-to-understand wiring.

Technical data

General

Operating voltage	230V, 50-60 Hz, or secondary 24V- 50-60 Hz 240V +10%, 230V –10% = 207- 230V
Output voltage	24V AC
Output current	Max 1A / heating zone
Max. number of connectable thermal valve drives	13
Dimensions (mm) H/W/L	70 / 75 / 302
Storage temperature range	-25 to + 60°C

Connection data

Connection type: outputs thermal valve drives	Screw less plug-in terminal technology
Connection type:	Output EIB
Operating voltage	24 V / AC +/- 20%
Power consumption (without load), at rated voltage	3 W
Fuse:	2A, delayed-action, common for all outputs
Operating temperature range	0 – 50 °C
Number of outputs	6
Type of outputs	Triac
Displays:	LED green: operating voltage 24V present LED red: faulty fuse LED red: programming physical address 6 LED red: channel switched ON
Automatic unlocking of the thermal valve drives after switching ON	10 min
Valve protection switching	Once daily if there was no triggering for a period of 6 minutes
Protective switching if the EIB part fails	Emergency program 12 min on / 60 min OFF

The application program: "6/12 outputs for valve drives"

Function characteristics

Parameter windows	Description
General	Basic settings: unit type and actuating variables supervision
Output 1...6 or 12	Individual pre-requirements for the triggering of the valve drives. Each output can be individually parametered.

Communication objects

Number of communication objects: max. 38
Number of group addresses: max. 66
Number of assignments: max. 66

No.	Object name	Function	Description	Type	Response
0...5 or 11	Manipulated variable of output 1...6 or 12	Input	Triggering of the valve drives	1 bit / 1 byte	Received
12...17 (23)	Forced position of output 1...6 or 12	Input	Activate forced operation	1 bit	Received
24	Summer operation	Input	Activate summer operation	1 bit	Received
25	Highest manipulated variable of all outputs	Max. value	Transmit current highest actuating value for all 6 (12) outputs (only for cont. regulation)	1 byte	Transmit
26...37	Failure of manipulated variable of output 1...6 (12)	Status	Transmit status message 0 = OK 1 = failure of man. variable from output x	1 bit	Transmit

Description

- **Objects 0...11 "Manipulated variable of output X"**

Input for the manipulated variable of the relevant output.

Each output can be individually connected with a switching or continuous regulating room thermostat. The use of the continuous manipulated variable is recommended. In this case it is possible that the reaction to change is faster and coupling with a boiler control unit is possible (see object 25).

- **Objects 12...23 "Forced position of output X"**

A 1 to one of these objects sets the relevant output in forced operation. The output then heats constantly at the fixed manipulated variable set on parameter page "output X" (0...100%)

- **Object 24 "Summer operation"**

A 1 to the object sets all those outputs which are appropriately parametered to summer operation and no heating takes place. During summer operation, a valve protection program can also be run if required.

- **Object 25 "Largest manipulated variable of all outputs"**

This object is available if at least 1 output was parametered as a continuous regulator.

The actuating variables of the outputs are permanently compared with each other, and the current highest value is always sent to this object. By this means details of the unit's current heat requirement can be passed on to the boiler, which can then adapt its output to the actual needs.

For each output it is possible to choose individually whether the output is to be taken into account in determining the highest actuating variable. In this way, for example, it is possible to exclude rooms in respect of heat requirements.

- **Objects 26...37 "Failure of manipulated variable output 1...12"**

Only available when cyclical monitoring of the manipulated variable of the room thermostat was selected for the relevant output.

If monitoring was selecting, the room thermostat output must regularly receive a manipulated variable telegram.
Recommendation: In order to guarantee problem-free functioning, the cyclical transmission time of the room thermostat should not be more than half of the monitoring time.
Example: Monitoring time 30 minutes, cyclical transmission time for the thermostat at least every 15 minutes.

If no new manipulated variable is received during the parametered monitoring time, the system assumes that the room thermostat has failed and an emergency program with a fixed manipulated variable (0...100%) is started. This function can be individually selected or deactivated for each output.

The monitoring time is set for all outputs jointly on the "General" page.

Description of parameters

The basic characteristics of the application can be set on the “General” parameter card.

Parameters on the “General” parameter card

Description	Values	Comment
General		
Type of heating actuator	**Heating actuator 6gang** Heating actuator 12gang	Select type of unit used
Transmit status of manipulated variable monitoring	Transmission always at end of monitoring cycle **Transmission only in case of failure of manipulated variable telegram**	Is the status to be transmitted in all cases, or only if there is a failure of the actuating variable?
Monitoring time of manipulated variable	**approx. 30 min** approx. 60 min	Setting determining after which period of time a failure of the manipulated variable is to be recognised if no more manipulated variables are received.

Valve protection:
When the “Valve protection” function is activated, during summer operation the relevant valve is triggered for 6 minutes every day.
This prevents the valve from sticking.

Parameters on the “Output x (1 – 12)“ parameter card

Description	Values	Comment
Output x (1 – 12)		
Type of manipulated variable	**Continuous (pulse-width modulated 1 Byte)** Switching (1 bit)	The room thermostat transmits an manipulated variable as a % The room thermostat only transmits switch-on and switch-off telegrams
Time for one cycle (pulse width modulated cycle)	4, 5, 6, 8, 10, 12, **15**, 20, 25, 30 min	**With manipulated variable“continuous”.** An actuating cycle consists of a switch ON and a switch OFF process and forms a PWM period. **Examples:** - manipulated variable= 20%, time = 10 min means: within the actuating cycle of 10 min, switched ON for 10 minutes (i.e. 20% of the actuating cycle) and switched OFF for 8 min. - manipulated variable= 70%, time = 10 min means: 7 min ON / 3 min OFF. See appendix: PWM cycle
Cycle time for forced position and manipulated variable failure	4, 5, 6, 8, 10, 12, **15**, 20, 25, 30 min	**With manip. variable “switching”.** In forced operation and in the emergency program the switch-ON/-OFF commands of the thermostat are replaced by a fixed actuating cycle. The cycle time is specified here.
Operating mode of combination valve body / valve drive	**De-energized closed** De-energized open	Adaptation to the installed valve drives: Details of the operating direction for the valve drive used can be found in the relevant operating instructions. (Valve drives 75900070/71)

Continued on next page

Summer operation and valve protection	Ignore summer operation Summer operation without valve protection **Summer operation with valve protection**	The output is to continue operating normally in summer operation. No heating during summer operation. No heating during summer operation, but the valve is to be triggered for 6 minutes every day to prevent it from sticking.
Manipulated variable at forced position	**0%**, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%	Select fixed manipulated variable which is to control the valve in forced operation.
Monitoring of manipulated variable telegram	Without monitoring **With monitoring**	Is the room thermostat to be controlled to see whether it regularly transmits an manipulated variable? This ensures that a thermostat fault is quickly recognised and an emergency program started.
Manipulated variable in case of failure of manipulated variable telegram	0%, 10%, 20%, 30%, 40%, **50%**, 60%, 70%, 80%, 90%, 100%	Select the fixed manipulated variable which is to replace the manipulated variable of the thermostat in the emergency program.
Use object value to determine the largest manipulated variable	NO **YES**	**For manipulated variable"continuous".** Is the output to be including in determining the highest manipulated variable of all outputs? See also: Object 25
Limitation of manipulated variable	**None** User-defined (on page Limitation output ..)	No limitation required. The highest and lowest manipulated variable in each case is to be parameterable

Parameters on the "Limitation output 1 – 12" parameter card

Description	Values	Comment
Limitation output x (1 – 12)		
Minimal manipulated variable limitation	0%, 5%, **10%**, 15%, 20%, 25%, 30%, 35%, 40%, 45%, 50%	Smallest permitted actuating variable.
Manipulated variable if falling under minimal manipulated variable	 0% **0% = 0%, otherwise minimum manipulated variable**	Limitation if an manipulated variable is received from the room thermostat which is lower than the minimum man. variable: Trigger output with 0% Every manipulated variable received which is less than the minimum value is limited to the value of the minimum manipulated variable which was previously specified. However, if no heating is needed (manipulated variable= 0%), the valve drive is switched OFF completely (0%).
Maximum manipulated variable limitation	55%, 60%, 65%, 70%, 75%, 80%, 85%, **90%**, 95%, 100%	Highest permitted actuating variable. A maximum value of 90% extends the operating life of the thermal valve drives. A maximum value of 100% reduces the number of switch cycles.
Manipulated variable if at exceeding maximum manipulated variable	 **Maximum actuating variable** 100%	Limitation if an manipulated variable is received from the thermostat which is higher than the maximum actuating variable: Limit output to the maximum manipulated variable which was previously parametered. Trigger output with 100%.

See appendix: Limitation of the manipulated variable

Note:

The standard values for the limitation of the actuating variables are set to 10% and 90%.

The minimum value of 10% results in the thermal valve drives reacting more quickly when heat is called for. A maximum value of 90% protects the valve drives without affecting the heating capacity, and extends the operating life.

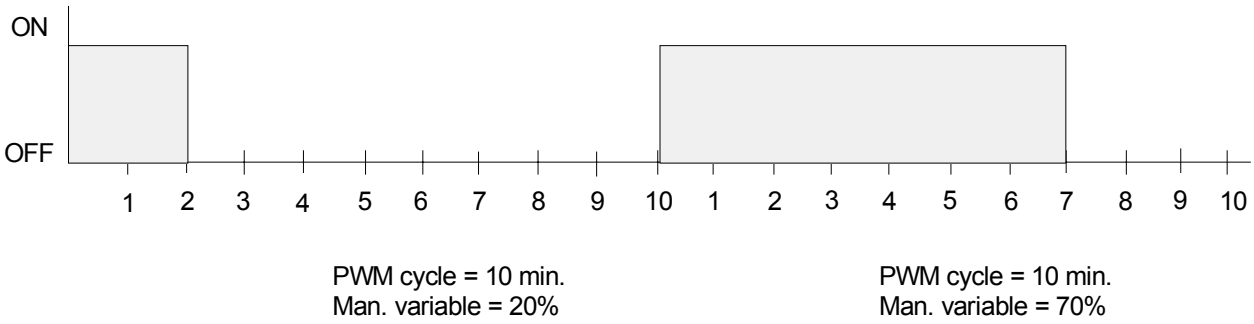
Appendix

PWM (pulse width modulation) cycle

To attain a heating capacity of, for example, 50%, the manipulated variable is converted to ON/OFF cycles.
For a fixed period of time (10 minutes, in our example), the valve drive is switched ON 50% of the time, and switched OFF 50% of the time.

Example:

Two different switch-ON times of 2 and 7 minutes represent the conversion of two different actuating variables, in this case one times 20%, and one times 70%, in a PWM period of 10 minutes.

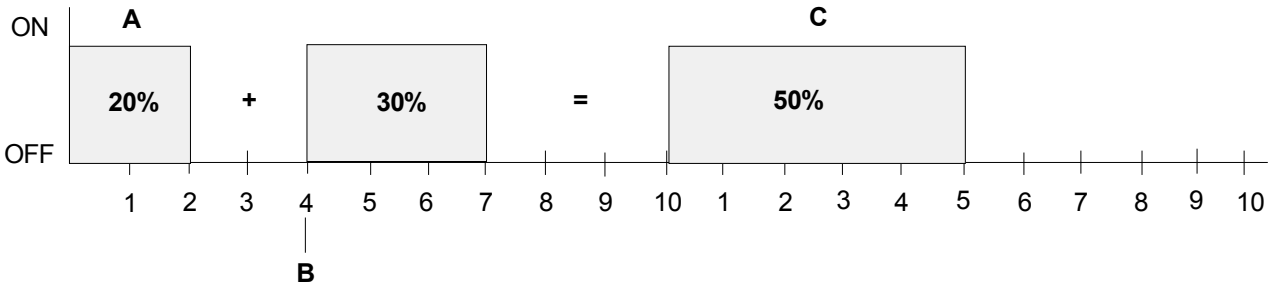


Reaction to changes to the actuating variables

In order to permit the fastest possible reactions to changes, every change to an manipulated variable is immediately transferred to the PWM cycle.

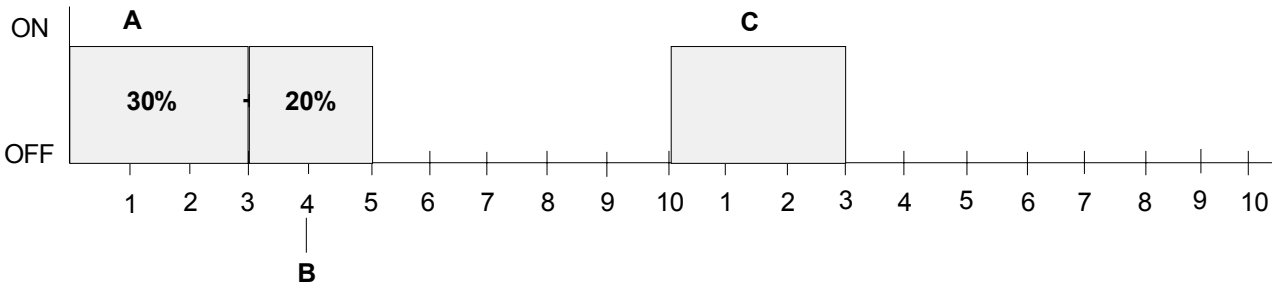
Example 1:

The last manipulated variable was 20% (A).
A new manipulated variable of 50% is received during the cycle (B).
The output is immediately switched ON and, as a result, the missing 30% of switch-ON time is added.
The next cycle is carried out at 50% (C).



Example 2:

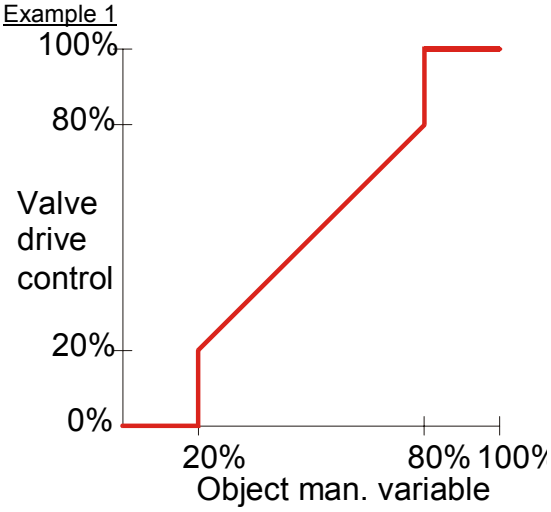
The last manipulated variable was 50% (A).
A new manipulated variable of 30% is received during the cycle (B).
After 30% of the PWM cycle has expired, the output is switched OFF, which means that the new manipulated variable has already been carried out.



Note:
If at the time of receipt the new manipulated variable has already exceeded the new target switch-ON time for the current cycle, the output is immediately switched OFF and the new manipulated variable is carried out during the next cycle.

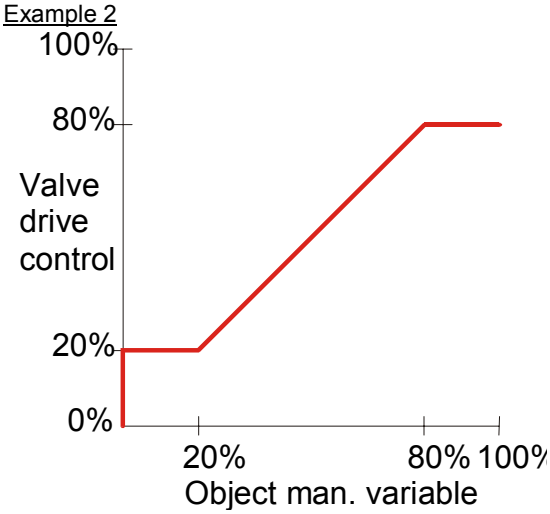
Limitation of the actuating variable

Example 1



Minimum manipulated variable:	20%
Maximum manipulated variable:	80%
Man. variable if value falls below min. man. variable:	0%
Man. variable if value exceeds max. man. variable:	100%

Example 2



Minimum man. variable:	20%
Maximum man. variable:	80%
If man. var. too low:	0%=0% otherwise min. man. var.
If man. var. too high:	Maximum manip. variable